SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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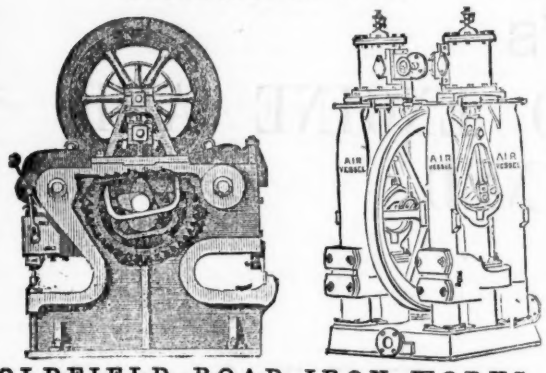

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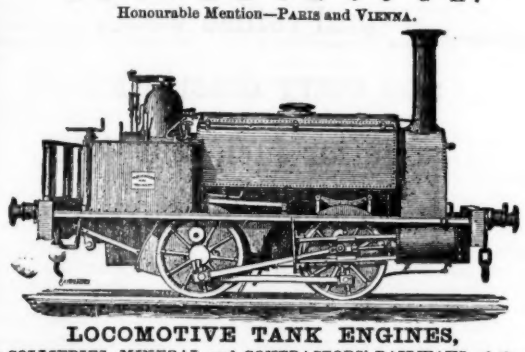

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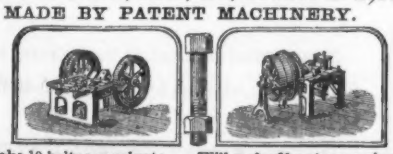

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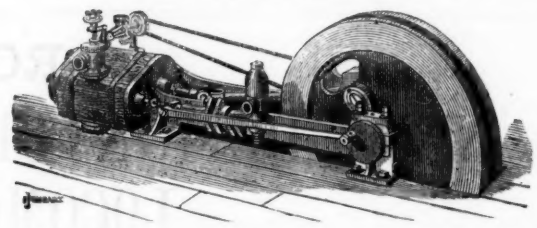

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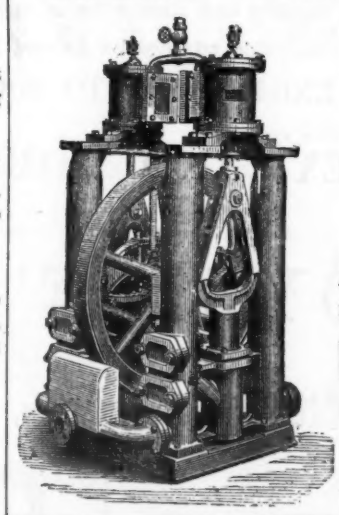

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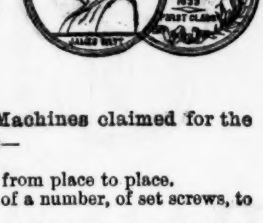

It has been selected by the Admiralty for their works, and is extensively used at the principal Mines, Collieries, and Quarries of Great Britain, and the Continent of Europe.

"To this invention, which appears to possess several advantages over the machines previously exhibited at Falmouth, the Judges are *unanimous* in awarding a first-class silver medal" (the highest award).—*Report of the Judges at the Royal Cornwall Polytechnic Society's Exhibition*, 1873.

"The boring machine works splendidly."—W. TORRANCE: *Mid-Calder.*

"For simplicity, compactness, and performance of work, your drill excels all others."—JOHN MAIN: *Crossfield Ironworks.*

"Under the most difficult circumstances, they give every satisfaction."—G. GREY: *Montreal Iron Mines, Cumberland.*

"The simplest and best boring machine."—Capt. WASLEY'S letter to the *Mining Journal*, Oct. 18, 1873.

"It gives every satisfaction."—W. E. WALKER: *Lord Leconfield's Iron Mines.*

"The rock-drill I bought of you seven months ago has given me entire satisfaction, and I am convinced that the 'Kainotomon' is the best rock-drill in the market."—P. MCGINNIS: *Strabane.*

"I am quite satisfied with the working of it. For sinking pits it is a first-rate invention; I can do as much boring with it myself as six men can do by hand."
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The advantages over other Rock-boring Machines claimed for the "Kainotomon" are—

1.—It is much shorter.
2.—It is much lighter, and more readily removed from place to place.
3.—It requires the turning of ONLY ONE, instead of a number, of set screws, to fix it in position at any angle.
4.—It may be fed 3 inches out of stroke, without stopping the working of the drill, *an invaluable advantage.*
5.—It is not liable to derangement.
6.—It has not one-third the number of parts in its construction.
7.—All stuffing-boxes and parts requiring adjustment are dispensed with.
8.—It is so simple in its construction that any ordinary labourer or miner can drive it, simply having to turn on the motive power and feed the drill.
9.—The rotation is compulsory, and regular.
10.—40 lbs. pressure only is required to work it.
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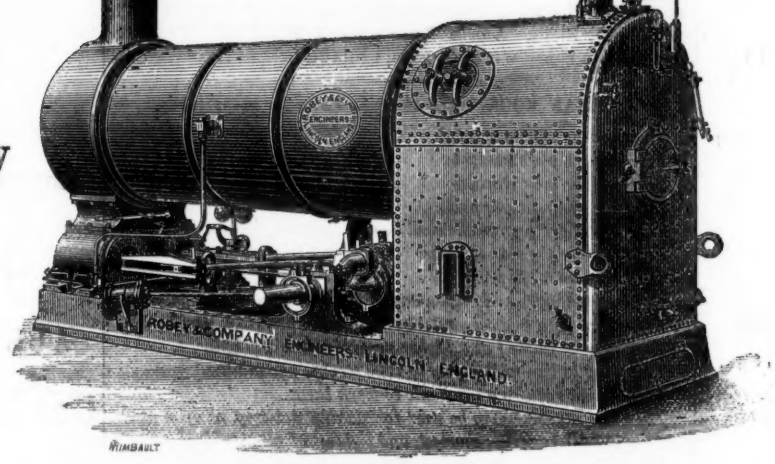

The Boiler is specially arranged to burn saw-dust and refuse wood, and every description of inferior fuel, and thus economise Coal.

Some of the advantages of the New Patent Engine are as follows:

Small first cost.
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Ease, safety, and economy in working.
Great saving in fuel.

This New Patent Engine is free from all the objections that can be urged against using the old style of Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable, in saving time and expense in fixing.

This New Engine is admirably adapted for driving Flour Mills, Saw Mills, Brick Machines, Pumps, Ore Crushers, Stone Breakers, and all descriptions of Fixed Machinery.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

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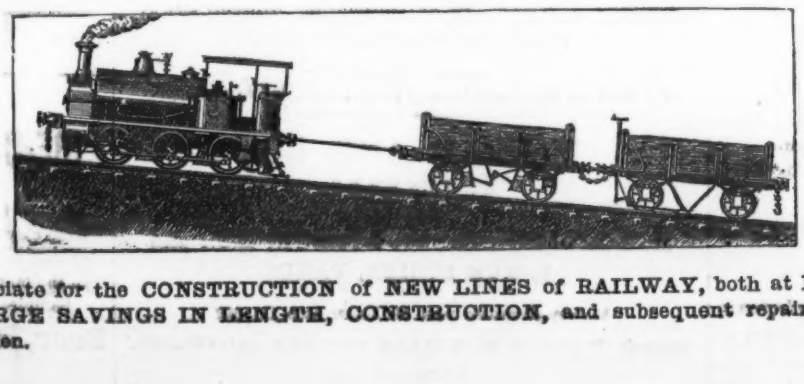

No alteration required in the ordinary Section of Rails, and no addition to the Permanent Way, such as Rack or Rail.

Also, the PATENT GRIPPING STRUTT and GRIPPING BRAKE, supplied and fitted to all classes of Railway Carriages or Wagons.

The Company is also prepared to negociate for the CONSTRUCTION of NEW LINES of RAILWAY, both at Home and Abroad, in accordance with the NEW SYSTEM, which will EFFECT LARGE SAVINGS IN LENGTH, CONSTRUCTION, and subsequent repairs; and is also prepared to negociate for EXCAVATION WORK of every description.

Original Correspondence.

COAL UNDER THE SEVERN.

SIR,—In reference to the paragraph in the *Mining Journal* of Dec. 4, stating that a new coal basin had been discovered under the River Severn, "totally unknown until now to geologists," allow me to state that on the Map of the Coal Fields of the United Kingdom, which accompanied the Report of the Royal Coal Commission, the extension of the coal under the Severn is distinctly marked, and that in the horizontal section of the district published by the Geological Survey the extension of the coal measures under the bed of that river, and especially under the place where the bore-hole is put down, is most distinctly coloured. —— COAL COMMISSIONER.

STEAM TRACTION ON TRAMWAYS.

SIR,—The proposals to introduce steam traction on tramways have been very numerous, yet, partly owing to legislative restrictions, and partly to the wide-spread objection to the tramways generally, none of them have been adopted in this country, and I think there are good reasons why they should not be. A publican at Handsworth, near Birmingham (Mr. John Downes, of the Red Lion), is now claiming that his silent locomotive engine is a remedy for all the evils complained of. Now, you must well understand that I have nothing to say against Mr. Downes's locomotive in particular, for I have never seen it, but I maintain that there are objections to steam traction on tramways which no invention, however good, can remove. Mr. Downes refers to the difficulties of procuring a full supply of horses for omnibus and tramway work, and admits that the destruction of horses in that class of work is enormous; he seems, however, not to comprehend the real cause of this scarcity and destruction. The great wear upon these horses is due to the constant stopping and starting far more than to the actual work demanded of them, and all who have had anything to do with omnibus management know but too well that the destruction to omnibus horses has increased threefold since tramways were introduced, whilst if steam traction were substituted for horse traction on tramways this increased destruction would again be doubled.

Long before the tramways were thought of it was noticed that where a roadway contracted, and there was only a very moderate traffic even, horses fell much more frequently than where the road was of uniform width. So it is with the tramways. The tramway company's rails monopolise a portion of the road, and the necessity for frequently pulling out of the way of the tram-cars, even whilst they are drawn by horses, produces a telling effect in the shape of broken-legged horses, to say nothing of the damage done by the tram rails breaking brougham wheels, overturning omnibuses, ruining small tradesmen by breaking their carts, and so on. This is with horse traction, which allows at least some time to get out of the way; what, therefore, must be expected from steam traction, such as Mr. Downes proposes? The fact of the engine being noiseless is of itself a very great objection, for we all know the difficulty after dusk, even now, when we have the tramping of the horses feet and the jingling of the bells to attract attention, of keeping clear of the tram-cars. Indeed, if steam traction be permitted the use of the line occupied by the tramway must be abandoned altogether by other than tram carriages, so that either the use of steam must be prohibited, as heretofore, or the tramway companies must permit all who choose to use the rails without charge, as some compensation for the increased danger which will result. ENGINEER.

New-street, Dec. 7.

THE MINING INTERESTS OF ENGLAND AND WALES.

SIR,—Intelligence of a disquieting nature reaches us from Australia in respect to the supply of tin and tin ores, and it is highly probable that the quantities forwarded to this country and to the marts of the world will become yearly augmented. With English tin at 87*l.* to 89*l.* a ton, the miner or producer receives only 48*l.* to 50*l.*, or at most 52*l.*, a ton for his ores, say 13 to 14 in 20 of metal. This is a sad state of affairs for mining in Cornwall, and the vast sources of wealth discovered at Dolcoath, Tincroft, Carn Brea, East Pool, South Crofty, and West Basset yield for the current year profits in the aggregate of less than 18,000*l.* to the several proprietaries; yet, in the face of this result, Dolcoath commands a market value of 172,000*l.*; Tincroft, 115,000*l.*; Carn Brea, 36,000*l.*; East Pool, 42,000*l.*; South Crofty, 17,000*l.*; West Basset, 30,000*l.*: total, 412,000*l.*, or about 23 years' purchase. Who can, therefore, gainsay the fact that Cornish tin mining still maintains its favourable position in public opinion as a desirable medium of investment? We may challenge without fear of contradiction any description of property to sell or stand so high in general esteem as the mines surrounding the Carn Brea Hills. Labour is greatly cheapened, and the price of fuel and materials much reduced; hence when the commerce of the world resumes its normal position, and notwithstanding the supply from Australia and of Straits, the price of English tin may possibly be sustained, yet it must not be lost sight of that a further fall of 10*l.* a ton will effectually extinguish dividends. This will prove a calamity to workmen, tradesmen, and merchants. The landlords will receive none and deserve no sympathy—they have had a long innings, and seldom has avarice been more aparent, or gains more greedily absorbed. It must be borne favourably in mind that the stoppage of the St. Just United, Balleswidden, Boscaswell Downs, North Roskear, Seton, North Crofty, St. Ives Consols, and many another mine will greatly lessen the supply; while the discoveries made at West Godolphin, Great Vor, and several other progressive mines will not for years supply more than 10 to 15 per cent. of the deficiency. It must again be remembered that mining adventure is peculiarly suited to the British mind; there is that degree of risk and hazard associated with the the pursuit of the hidden treasure, as to spice it with interest, and thus it ever stands in favourable contrast with most of our home industrial undertakings. Again, mining is not the only enterprise that stands at this moment depressed in commercial worth. Joint-stock banks, foreign loans, and almost every other description of property have received a severe check. Among the first named the last half-yearly dividend of the London and County fell from 20 to 16 per per cent.; London and Westminster, from 22 to 10; London Joint-Stock, from 22 to 15; and the Union of London, from 20 to 15 per cent. Again, in foreign stocks, note the decline in Peruvian, Turkish, Costa Rica, Greek, Spanish, Honduras, and many another; while gigantic commercial firms have failed, which clearly show that the trade and commerce of the country is conducted with far greater (or equal) risks and hazards with legitimate mining; the principles of finance are as hollow and rotten as the visionary vagaries of the dowsing-rod. What good can possibly result to the mining interests of this country—from the advancement of the arts and sciences, coupled with practical observation of Nature's laws in the formation of deposits of mineral wealth—if the votaries of the long-exploded dowsing-rod receive encouragement from the Press, and continue to gain support and capital from the uninitiated and reckless schemer, destitute of means, and for ever on the look out for the happy possessor of wealth.

During the year we introduced Pateley Bridge Mine and Smelting Company to the London public, and we perceive that the report states the returns of lead for the month are estimated at 60 tons—now quoted at 22*l.* a ton. This property is capable of great extension, and promises to become one of the most profitable throughout the kingdom. Again, in Yorkshire, there is the West Craven Moor; in Cornwall, West Chiverton (resuscitated), the New Consols likely to expand in magnitude, and also to become highly profitable. In Shropshire the Roman Gravels has fully equalled our expectations, while Tankerville has regained an enviable position. The Welsh mines have proved tedious in development, and we cannot refer to many that call for special comment, excepting the Grogwinion, Harlech, and Llanrwst among the sound progressive and early dividend properties; yet we can draw attention to the continued prosperity of the Van, East Darren, Lisburne, North Hendre, Minera, South Prince Patrick, Prince Patrick, Tyllwyd, and Wye Valley—all of which have yielded dividends during the current year, though one or two may be questioned as to finance. The Laxey, Isle of Man, continues to pay well; and the copper mines of Cornwall may be summed up in South Caradon, Glasgow Caradon, and West Tolgus. By far the greatest number of prizes, and the choicest gems are among the lead mines, and one of them—the Van—has already paid the sum of 238,875*l.*, the last quarterly dividend being 10,500*l.*, and the present market value is 450,000*l.*, or just 600 per cent. gain on the capital embarked, to which must be added the dividends already paid. RICHARD TREDINNICK,

43, *Bishopsgate-street, Dec. 8.* Consulting Mining Engineer.

ON THE BLENDE MINES OF CARDIGANSHIRE.

SIR,—You were kind enough in last week's Journal to insert a letter from me on the "Abandoned Mines of Cardiganshire," which I hope and have reason to believe will be attended with good results to the mining community here, as well as the owners of the ground, by being the means of bringing in the necessary capital to resuscitate them, and to bring them again into flourishing and dividend-paying properties; and if this should prove correct my end and ambition will be attained. Of the mines I am now about to speak there cannot be the possibility or shadow of a doubt that if they are worked systematically very large profit would ensue, more so, in fact, according to the relative value received for the ore than any lead mines now at work in this county. I will first take Nanty Cria, which is one of the best filled mineral veins I have ever seen for its width, which, on an average, is about 6 ft., nearly solid blende, but sometimes carrying good branches of lead, varying from 6 in. wide. The management of this mine was placed in the hands of my late brother Matthew and myself, and continued with us for some years. During the whole of this period a contract was made to deliver all the blende ore into the store-house at Aberystwith for 40s. per ton; and at this price, and getting from 9*l.* 10s. to 11*l.* for the lead ore, we made an annual profit of from 1200*l.* to 1500*l.* I can say truly that the vein has not deteriorated in value, and as there is an abundant supply of machinery for all purposes erected on the mine it is capable, with the present price of blende, of giving a profit on 100 tons per month of 5000*l.* per year. Yet, strange to say, there is not a miner working in the grant.

Another instance of where tens of thousands of tons of blende have been raised, and thousands more standing that could be raised at 3*l.* per ton, is the Rheidol Lead Mines, where there are about six men making trials and opening out paying ground; and although the machinery is all on the mine, with the river to work it, the ore is allowed to lie on the mine, and the machinery to rot. I happen to hold some interest in the latter, and have over and over again pointed out what I am now writing; and seeing that it has resulted in nothing, I am induced to lay these facts before any parties that may be interested, hoping that matters will not be allowed to be left in this scandalous state, but that the mines will be at once fairly set to work, when, with the present price of blende and lead, and worked energetically, they are capable of giving 6000*l.* per year profit. There are other mines that will pay well for blende at the present price, amongst which I can name the Castle Mine, or the western portion of West Esgair Lle; and they will no doubt have the good sense and judgment to carry on workings actively as long as the high prices now obtainable are to be realised, besides some others I might name of smaller magnitude that could be made to pay handsomely, with a small amount of capital for the erection of machinery, amongst which are Tyn-y-fron, South Bwadrain, and Camdwr Bach; but the really great and good paying blende mines are the two I first alluded to—Nanty Cria and Rheidol Lead Mines. It is a disgrace to the county and mining generally that they should be allowed to lie dormant when so many would reap the benefit of a spirited working of them.—*Goginan, Aberystwith, Dec. 7.* ABSALOM FRANCIS.

MINING IN CARDIGANSHIRE—No. II.

SIR,—According to my promise, I have gone through the valley of the Rheidol Mines, and am proud to say that they are, upon the whole, looking better than I expected to have seen them. The first in the Vale is the Ystumtean Mine, already spoken of; the next to this mine is the Tyn-y-fron, which has been idle for many years—why I cannot say, for a more promising property is not to be found in the Principality. If I mistake not, my friend Capt. Williams, of the Van Mine, at one time told me he would prefer this to any other mine in the county, and that is saying much indeed. The little that has been done here has opened up a course of blende that would surprise any stranger, and scores of tons are on the surface now. This alone, according to the present price of blende, would pay for the working of the property; but then, remembering that this mineral rides a better horse by far, how much more encouraging will it be when we know of the properties lying between this mine on the course of the lode into the Van Mines into another county. I say little has been done; there is the adit level in the side of the hill far up from the River Rheidol a fall of ground sufficient to erect any flooring for dressing any amount of lead and blende, for by-and-bye this blende will give way to the rich lead ore known to exist in all the eastern mines. This will bring us to the adjoining Old Caegynon Mine. Unfortunately, the machinery has been taken away from this mine, or else there are parties who are anxious that I might afford them the assistance required respecting the leases, so as to work it again. This mine at the present price of blende would doubly pay for its working, as every bit of it might be broken, raised to surface, and taken to the town either for shipping or train for about 45s. or 50s. per ton to the extent of dressing, and a better-priced blende may not be found in the valley. This mine is 70 fms. from surface; but, the hill rising so perpendicularly, the bottom of the mine is not 10 fms. deeper than the river's bed, and, although the machinery is all taken away, yet at the present time everything could be done which would be required for working the existing levels for blende and lead. The shaft could be sunk 10 fms. or 20 fms. deeper, and more if required, by erecting a water-wheel, pulleys, stands, &c., and sufficient pumps could be at once dropped in the new shaft that runs to within 4 fathoms of the deepest part of the mine, this 4 fathoms being an arch of ground never as yet taken away. In the bottom of the old mine the lode so far has made a great change for the better just before the old company wound up. The lode in the bottom level is worth for lead varying from 5 cwts. to 25 cwts. to the fathom. Why, then, could they have been so blind as to have given up such a good and promising concern? I have heard that through some flaw in the granting of a future lease compelled them to do so. Greater shame to the lords, I say.

On the other side of the river, but upon the same lode, may be seen the Rheidol Mines, a lot of them united into the above name as one concern, although I have, as well as hundreds more, known them all doing something. It is about 1 mile square, known by their names as the Alitddu, Llwybrllwynog, Rhiwriggos, Gwaith-Coch, the Imperial, and many others I cannot now remember, being over 30 years ago when I first visited the valley. This run of mines is on the same lode still as others mentioned before, coming away straight from the Van down through the different mines into the Aberystwith, Ystumtean, Tyn-y-Fron, Caigynon, and into the Alitdde. We first find it on the south side of the river in the valley; herein I find there are six men working, driving the 30 fm. level west upon a lode from 1 to 2 fms. wide—saving work for lead, copper, and blende. Now this mine in the deepest part is only about 15 fms. under the bed of the river; I would, therefore, recommend to the company, as I did to the agent, going 20 fms. deeper, when they may relie upon meeting more lead and less blende. I would say a certainty. Again, in the Gwaith-Coch part of the sett I would advise by all means to sink 20 fms. deeper, and stop all other proceedings until the shafts in the two mines were sunk to their 10 fm. level first, then to another 10 fm. level; it would be quite sufficient to prove the whole range of mines whether to sink further money or give it up. The appearance of the ground in the bottom of the different workings now is sufficient to induce me to give this advise, whether adhered to or not, but before anything further can be done a new water-wheel must be brought on the mine, and as I find one in the Journal advertised just the thing for them, I hope they will get it at once. Taking all things into consideration, I think 1000*l.* will thoroughly try the property from east to west. The South Bwadrain Mine is here in the same dale, but the other side of the river, consequently not on the same lode, and, indeed, being for so long time idle, I can find no encouragement to speak of this property at present.

We shall come next to the Tyllwyd Mine, which I find has been entered amongst the dividend mines. I hope it may be able to keep itself there, because we know (some of us to our sorrow) that it is a most difficult position to keep a mine in; but, once entered, we must all hope not only to stay, but to improve, and rise higher and higher, until it becomes like the Van. The Tyllwyd, which is the most western mine in the district, is about 25 fms. under adit. Although not as yet any levels to this depth, a cross-cut was being sent out to meet with the lode from whence the old miners got all their lead. I expect by this time they have a communication; I hope it may amply reward them for their outlay. Everything going on pleasantly and comfortably. I met the lord at the office of the mine, also Capt. J. Paull and Sons, and was glad to see them so cheerful upon the good prospects of the mine: 20 tons of lead sold, 20 tons again on its way to town, 20 tons again to be sold as soon as the frost, &c., will allow: machinery again to revolve upon its axles, for now it is something like wild duck season, and unless it clears shortly I think we may all hands turn out in search of that good winter food.

South side of the river we come to another mine, the Aberfrwyd or Gothic Mine. It is now idle, but for many years worked by two English gentlemen then living in Aberystwith. I was with them for a number of years. Since then other parties have had good sales of lead from it, and the last time it was working it was with some tributers who made good wages. The mine was at last taken up by the miller of the Vale, who is still paying a dead rent of 25*l.* per year, but cannot go on in the right way to get up a company, and there it is, waiting some party to join the miller or to make a purchase of it and work it, when no doubt of its again doing as well as any mine in the valley. I think this is the deepest mine under the river in the district, being about 40 fms. below it.

Now, my letters of the past and at the present are no more than trying to induce gentlemen to sink their mines deeper before they despair of good luck. At most, every mine throughout this country has been worked and stopped, and again, by sinking deeper, as new parties have done, they have been rewarded. Remember the one cow more of our Treiddol friend in the Goginan Mine. Remember the old men who worked the Powell United Mines 80 years ago; what have they done since? Remember the Van Mine; see what it is now. In fact, I could class them most all in the same list, who, had the mines voices, would cry out—"Sink us to our wonted depths, and you shall meet with your reward." My next journey will be on and through the Penrhyncoch district, commencing at Cefn Gwyn, through Mynydd Gorddu, Elgar, Court Grange, &c., which I will try and see before Christmas.—*Rheidol Cottage, Dec. 6.* SAMPSON TREVETHAN,

—— Consulting Mining Engineer.

NEW CONSOLS TIN AND ARSENIC WORKS.

SIR,—In reading your valuable Journal I have for some time past observed remarks relative to these mines, and being mixed up from time to time, and listening to the sentiments of practical mine managers and others who are not favourably impressed with the prospects of the mine under the present system of working, which is for tin, copper, silver, and arsenic, and is extensively carried out by means of the new process of precipitation, I determined and accordingly made it my business to visit this property; and after a careful examination of the works, after what I had previously heard, I must confess I was never more surprised. It is well known that chemistry in Cornwall has ever been thought but little of, but should anyone make a visit as I have to these mines, and look at the 16 tons of precipitated copper now ready for the market, and estimated to be worth for copper and silver from 60*l.* to 65*l.* per ton, together with over 100 tons of arsenic and 5 tons of tin, all of which is the result of one month's working, he will be as I was—agreeably surprised.

That Cornwall is a most prejudiced county to new inventions is an acknowledged fact, but certainly any rational person cannot but be convinced of the profits arising from the present mode of working in this mine, and I am satisfied that shortly we shall be able to compete with foreign counteries for these minerals, and shall again see our old Mother County flourish. Systematic economy is established in the carrying out of these works, and I must say that great credit is due to Capt. Richard Pryor for his long perseverance and unfailing energy; and I would strongly recommend all mine managers and agents to pay a quiet visit to these works, and depend on it other mines will soon follow. It is my opinion that many mines which could not pay their way on the old style would make good profits if worked on the principle on which this mine is now being conducted. Go and see for yourselves, and let us one and all do our best to compete with other countries for that for which our county is celebrated—fish, tin, and copper.

A LARGE ADVENTURER IN CORNISH MINES.

Gwennap, Dec. 8.

WHEAL GRENVILLE MINE, AND ITS MANAGEMENT.

SIR,—In looking over the Journal recently the affairs and business of this concern could but strike my attention. I shall not attempt to even give an opinion on the changes and matters generally that have occurred here, simply because I do not consider myself a proper judge, but with other things at the meeting, and after the secretary had been dealt with, I notice that the management of the mine came into question. Respecting this I am also quite ignorant, and all I can say is if the conducting of the working of the mine failed to satisfy the proprietors it was not for want of having men of great experience at the helm. But at the meeting, and in dealing with the management as to whether or not a change was necessary, the name of Mr. Stephens appear lumped in under that heading—one, if I am informed rightly, has never had anything to do with the management of the concern. Now, I happen to know this gentleman well for many years, having been mixed up with him in the same mines, which enables me to boldly state that there is not a more competent, industrious, honest, and harmless man in the county of Cornwall, and this is perfectly well known to all who are acquainted with him. I will add that whatever might be the state of the management of this concern I can vouch for his honesty, and my hope is that the company and Mr. Laws, the new secretary, will retain him in office. It would grieve me sorely, as well as many others, to learn of him suffering in any way, owing to any change that has taken place in the management of this very promising mine, a concern that is considered of vast importance by all mining men in the neighbourhood, and one that will ultimately prove a success.—*Gwinear, Dec. 8.* MINE AGENT.

WEST MARIA AND FORTESCUE MINES.

SIR,—It would be a matter of some difficulty to find a series of communications more plausible and, at the same time, more deceptive than those which have recently appeared with regard to these mines. In the first place, "Medicus," in a glittering description of the workings, led the shareholders to look forward to the almost immediate declaration of dividends, whilst at that very time it was clearly evident from the published weekly reports that scarcely a single exploratory point on tutwork was being prosecuted in any portion of the mines. This was followed by the letter of "A Shareholder," who represented that two entrancing sums—one amounting to no less than a thousand pounds—were at the disposal of the company, which it now turns out existed only in the imagination of the writer; and in the Journal of last week an elaborate statement is published, by which it is made to appear that the dispute with the proprietors of West Maria, which has recently been decided against the company, is actually given in their favour. This question of arbitration as described in the Journal a fortnight since resolves itself into a very narrow compass, and, divested of the extraneous matter imported into it by the writer of the report in the Journal of last week, stands as follows:—The West Maria and Fortescue Mines are held under two grants from two separate landowners, and are worked by the same company. The company sought to set up the right of hauling all the raisings from Wheal Fortescue through the West Maria shafts, and of depositing the stuff on the West Maria land. The proprietors of West Maria, considering this to be an unjust encroachment on their property, applied to the company for compensation, which was refused. A Bill in Chancery was then filed for the purpose of obtaining a settlement of the matter, and, after several hearings in Chancery as to whether the question should be tried by the Vice-Chancellor or by arbitration, and after conflicting decisions had been given on this incidental point, then one way and then another, it was ultimately decided to leave the question to a gentleman of well-known reputation in the West of England; and after a full hearing of the matter in all its bearings his decision, both as to way-leave through the shaft, and also as to compensation for land damaged by the deposit of the refuse, has been given in favour of the proprietors of West Maria. For the use of the shaft a minimum rent of 50*l.* per annum is fixed, and for the deposit of stuff 160*l.* per acre is awarded. This being an important decision, which will probably stand as a precedent in future, it might reasonably have been supposed that the utmost care and truthfulness would have been observed in supplying the particulars of such a decision to the leading journal in mining; so far, however, from this being the case, conjecture, prejudice, and error are so intermingled as to mystify the whole case, and, to make the mystification still more complete, one-half of the award—that which refers to the compensation of 160*l.* per acre for the deposit of the refuse on the land of West Maria—is absolutely suppressed. OBSERVER.

Dec. 7.

FRONTINO AND BOLIVIA GOLD MINING COMPANY.

SIR,—Had "Reason" followed the chequered career of this company with as much interest as I have done during the past ten years, and known how entirely we are indebted to Mr. Foakes for our present satisfactory condition, I think he would not have written to object to the proposition of Mr. Young, to present the 350 shares as a small acknowledgment of the shareholders' gratitude for all Mr. Foakes has done for them. The brothers White have certainly done their duty well, but had it not been for our excellent Chairman they would have had no opportunity of doing for us what they have done, as the Frontino and Bolivia Company would have ceased to exist years ago, instead of a part of the property only now yielding us over a thousand pounds profit per month, with every prospect of making at least twice this amount by the end of the year. Under these circumstances, I cannot think that any shareholder who knows what Mr. Foakes has done for the company will be found spirited enough to move the amendment proposed by "Reason." HOLDER OF FIFTY SHARES.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY.

The eleventh half-yearly general meeting of shareholders was held on Dec. 3, at the offices of the company, Finsbury-circus,

Mr. PHILIP H. NEEDHAM in the chair.

Mr. H. G. DENNISS (the secretary) read the notice calling the meeting. The report of the directors, which has already been circulated, was taken as read.

The CHAIRMAN moved the following resolution:—"That the reports of the directors and manager, and the accounts to June 30 last, now submitted, be, and the same are hereby, received and adopted." He would make a few remarks upon the report and balance-sheet. In the first place, he would refer to the results of the half-year, which, as they would have noticed in the report, showed a very favourable result as compared with the corresponding period of the previous year, the net profits for the last half-year having been 13,387*l*. The balance-sheet was made up in a more detailed form than at the last meeting, in order to show where the ores were and what their position was. The directors had hoped by this time to have paid the dividend which was authorised at the last meeting, and the only cause why it had not been paid was the unfortunate detention of the Palmerston, which had on board more than sufficient to pay the dividend, and ought to have been here more than two months ago. She got as far as Cape Horn, where she met with an accident, and had to jettison a part of her cargo, including a portion of this company's ores. On Oct. 10 she went into dock for the purpose of repairing damages, and she must have left by this time, and be well on her way to England. The ore which had been jettisoned had been covered by insurance, and the company would, therefore, sustain no loss. Referring to the company's position as regarded water, he was glad to see Mr. Breach had reported that the late rainy season had been the heaviest he had known; therefore, they might look forward to having a good supply of water throughout the remainder of the season. The vessels coming home were the Palmerston, with 300 tons of ore; the Guaymas had arrived with about 140 tons; the Ellida, with 50 tons, was now daily expected, and the Cristel, with 300 tons, would probably arrive about January, and there were also about 120 tons coming by a steamer which was expected to arrive at Liverpool on Dec. 15. He would read the following extracts from a letter received from Mr. Breach since the report was made up, dated Oct. 14:—"Docile ores: In consequence of the diminution in the quantity of green ores pending discoveries, the mill now has to run part of the time on black ores only, and green smalls for concentration. I believe we can keep it fully employed until the black ore in the Mina Grande is opened out for stoping. The present output of black ore is limited by the power of the engine underground, as with the exception of the Purisima ores, and the ore from the new east lode all has to be wound up the Tirito shaft. We are working the engine up to the full power; of course this is only for a short time, until the 12 fm. level in Mina Grande commences to yield, and which we have a right to expect to receive assistance from daily.—Tirito Mine: The sinking of the engine-shaft below the 32 was commenced on the 11th, and will be continued without interruption. The new pumps being in place and working well, I do not anticipate the delay that we were subjected to while sinking the other lifts in this shaft. The black ore stopes over the 10 and 20 fm. levels continue to yield well, and the ore improves as we rise; the green ore over the same levels is now limited as regards the output, and all the stopes in both faces are worked up, and in places holed to the level above. We are now cutting out the remaining ore and letting down the timbers and waste from the works over.—Providencia: In the winze sinking from the 20 to the 32 we still have some green ore; we think week commence to rise in the 32 in order to hole quicker, and find that ore is making to the south of the rise; it appeared to be about 3 ft. wide, of fair green ore. I do not expect it to widen; it will be a help to us at the present time, and as soon as the rise is holed, which I expect will be in three weeks or a little more, we shall commence a stope in the back of the 32 and prove the ground; as it is immediately over the ore we cut in driving the 32 there is a chance of its going up some little distance. The new east lode over the tunnel continues to get more solid as we drive on it. We are now cutting into it from the tunnel, but are not yet in payable ore, being apparently on the extreme north point of the lode. I have good hopes of this being an entirely new and distinct lode; we have driven on it 17 ft. in length by 8 ft. wide, and it improves as we go. In Purisima the prospects are fair, and the black ore improves. The black ore in the extreme north end of the 10, back and about 12 ft. below the tunnel, has now gone to the east, and is almost in a line with the new lode, with which I think we shall find it connected. The green ore in the same back we have left off stoping, as the tunnel is directly over it, and we have taken all we can in prudence stope away.—Mina Grande: We last week holed in the 12 to the winze, and are now driving to the north with all possible speed. The ore we cut in the winze and level proves to be a vein of pitanque metal outside the orey point of the lode, and varying in width up to 7 or 8 in., we have cut through it, and are now driving through spar similar to that found next the ore in the tunnel, so that we expect at any moment to cut the ore body. In the tunnel end we have still the promising spots of ore, the appearance of the ground leads us to suppose that where we now are the lode is pinched, and in the surface at the corresponding point it is very plain to be seen to be so, and I think we shall have to drive further to give the lode room to open out before we may expect to meet with ore in payable quantity. I find I have omitted to make mention of the cross-cut in the same level under Providencia to the east. We last week drove into the country ground without meeting with any defined wall. The rock gradually changes from one class to another, and at last is almost a limestone. As specimens of the eastern formation I have selected a few stones, and will send them on the next trip of the Providencia. The ore cut some weeks since, mentioned in my letter No. 38, if not a part of the new east lode, is a vein joining it, as we can now very distinctly trace it in three different cross-cuts.—Lixiviation: The results of the roasting process are now complete, and are as follows from the trial of 24 tons. Total expenses of roasting, including wages of foreman and all labour, 37·77 per ton. Considering this is the first lot operated upon, I do not think that this can be in any way considered as unfavourable.

A SHAREHOLDER: Is this the new process?——The CHAIRMAN: Yes.

The SHAREHOLDER: And do I understand that he considers the process unfavourable?——The CHAIRMAN: No, he does not think that this can in any way be considered as unfavourable. It would be seen from the extracts he had read that the black ores discovered were now taking the place of the green ores. He thought they might fairly look forward to the successful application of the lixiviation process. The directors had taken the subject into consideration, and they did not expect any difficulty would arise; they hoped the lixiviation process would prove a success, and be a good substitute for the present process of amalgamation.

A SHAREHOLDER asked whether the insurance effected on the ore which was jettisoned at Cape Horn was ample to cover all loss?——The CHAIRMAN: It is insured with a good margin upon the estimated value.

The SHAREHOLDER: Have you received the insurance money?——The CHAIRMAN said that they could not receive the insurance money until the vessel arrived. He added that it was always the practice of the board to insure with a margin of 10 per cent. beyond what they expected the net proceeds to be.

Mr. F. SWAFFIELD said that the extracts which had been read from Mr. Breach's letters were very interesting, but, as a shareholder, he must say it would be more satisfactory to him if he had the information to read in his own office, so as to be able to study it at his leisure. It seemed to him that the great want of the shareholders was to have more information, and he did not see any insuperable difficulty to monthly reports being distributed amongst the shareholders, so that they might see what progress and what profit was being made. Many companies sent out monthly reports, and it would be very satisfactory if it were done in this company. There was a question he should like to ask with respect to the accounts; they stated—"By income—silver ore and petanque metal raised, 37,924*l*.;" he would ask whether that included the 3900*l*. of additional valuation of the ore?

The CHAIRMAN: Yes, it does.

Mr. F. SWAFFIELD said that in that case it seemed to him that the accounts were not quite correctly made out, as Mr. Breach stated that the whole of the profit did not belong to the past half-year. In the profit and loss account they had written off a small amount for depreciation of furniture, and also off the schooner Providencia, and he thought it would also be right to write off something from the property account. He would ask whether the 120 tons of ore expected this month was in addition to anything stated in the report?

The CHAIRMAN: No.

Mr. F. SWAFFIELD went on to say that the financial position of the company now seemed so strong that he should like to know how it was that they were put off so long before the dividend was paid? The directors stated that the dividend would probably be paid when the Palmerston and the Cristel arrived; he gathered that the Guaymas had arrived at Swansea with about 140 tons of ore, and the Ellida and Cristel were expected to arrive in January, and now they heard that another 120 tons of ore were expected. He would ask what estimate was put upon those 120 tons?——The CHAIRMAN: About 2000*l*.

Mr. F. SWAFFIELD said that, as he made out, the estimated value of the whole, including the cargo of the Palmerston, was about 17,800*l*., and, therefore, he would ask why it was that the shareholders had to look forward to waiting two or three months longer for a dividend, seeing that it would not take anything like that amount to pay the dividend which was authorised at the last meeting? He thought the dividend might fairly be paid before that; if the company wanted a temporary advance he was sure the bankers would willingly grant a loan. He thought that shareholders were somewhat wronged by having to wait so long, as probably a good many of them would part with their shares, seeing that the dividend was not paid. If the dividend was paid more regularly he believed that shares would stand in a better position.

Mr. W. J. WILDE said he entirely disagreed with the suggestion of the last speaker relative to obtaining a loan for the purpose of paying a dividend; the directors had no right to declare a dividend until they had the money in hard cash. (Cheers.) No one could say what was underground, and in a mining company they should always adopt the safest plan in regard to paying a dividend, and the shares were worth more in a company conducted in that way than in a company which divided the money before they got it. There was another point he would refer to; he had not been a shareholder long, but he must confess he was sorry to see that they were still charging money to construction account. He could not make out that there was anything very particular going on, except what was always going on in a mine; it was not as if they had started any heavy work, but they simply seemed to be carrying on what was the ordinary work of a mine, and it was not safe for a mining company to consider anything as profit whilst they were still charging anything to capital. He thought the capital account should be closed, except for any distinctive work. A mine was not like a railway, where the money was spent, and there was the work, which, if properly constructed, might last a very great number of years, but in a mine they were gradually taking their property away—it could not last for ever, and it was safer not to go on adding to the capital account, and this was more particularly the case in a mine, which they were gradually working out. Therefore, his objection was to the 2197*l*. which had been added to capital during the past half-year.

Mr. F. SWAFFIELD said his suggestion met that difficulty; there might be in a particular half-year a large expenditure, but by writing off 10 or 15 per cent. they distributed the outlay over a certain period.

Mr. PARTINGTON said he did not go quite so far as Mr. Wilde in looking upon this as a speculation, because as far as the ore was concerned which had been obtained and was on its way home there was no speculation, and, therefore, he agreed with Mr. Swaffield that this represented money value, upon which an advance might be obtained at a low rate of interest, and the money fairly distributed amongst the shareholders. Of course mining was a speculation, but there was no speculation with regard to the ore which was actually on the surface, and which they could count upon as being of a certain money value.

A SHAREHOLDER said he thought the directors were quite right in not paying a dividend until they had the money actually in hand. Of course there was no speculation as regarded the ore actually on its way to this country, but it might be some considerable time before it arrived here. He hoped the directors would put 20 per cent. of the proceeds to a reserve fund, and clear off the debentures, and then they could go on freely in future years. (Hear, hear.)

Mr. PARTINGTON: I quite agree with you in the desirability of clearing off the debentures.

Mr. GOULD expressed a hope that they would not distribute money until they actually had it in hand.

The CHAIRMAN replied to the different questions and observations. He said the directors had been in the habit of publishing the monthly reports as they received them, and that latterly they had included any new discoveries which had been made which were of any interest to the shareholders. There could be no possible objection to sending out a monthly report; the trouble would be small, and he did not suppose it would be a matter of very great expense. If the shareholders wished it the directors would only be too happy to meet their views in that respect. (Hear, hear.) As regarded the payment of dividend, it had been the policy of the directors never to forestall dividends, and only to pay them when they had the cash actually at their bankers. (Cheers.) It was quite true that the directors could go to the bankers and pledge the bills of lading and deposit the insurance policies, but it had never been the policy of the directors to do this, and as far as he was concerned he should deprecate anything of the sort, as he believed it might be prejudicial to the general interests of the company. (Hear, hear). The shareholders must remember that all the money received for ores as they arrived was not immediately applicable for dividend; there were bills to be paid for quicksilver and other stores ordered at San Francisco. As he had before stated, the dividend would have been paid before his if the Palmerston had arrived in due course. She sailed in March, and the directors fully calculated upon her being here before now. It was an unfortunate detention, and nothing more. As soon as the directors had the money actually in and they would pay the dividend which was authorised at the last meeting.

Mr. F. SWAFFIELD: And even with respect to a fresh dividend beyond what is already authorised?

The CHAIRMAN: That will require a further authorisation from the shareholders. As soon as we are in a position to make a further distribution it will be easy to call a special meeting, and ask the shareholders to authorise a further dividend.

Mr. PARTINGTON: I suppose you keep the cash you have in hand on deposit?

The CHAIRMAN said it was deposited at the bankers, who, however, did not allow much interest upon it. At the same time, however, the directors obtained every shilling which they could. As regarded the 2197*l*. added to construction account for the half-year, this was for surface work, and did not apply to any exploration of the mine. They had erected two furnaces for the lixiviation process, and this involved the construction of a large chimney, and an extra boiler had been put up. They had also had to purchase piping to bring the water from a new spot to the mine, in order to avoid any deficiency of water in the dry season. These were matters which the directors considered fairly belonged to capital and not to revenue expenditure. He agreed with the policy of building up a reserve fund.

A SHAREHOLDER: Have you authority to do it?——The CHAIRMAN: We have. He also agreed with the policy of providing a depreciation fund.

Mr. J. A. MORGAN (solicitor) in answer to a further question, said there were two funds contemplated in the Articles of Association—one a reserve fund and one a depreciation fund, limited to a percentage of the profits. When the proper time arrived it was in the discretion of the directors to carry a proportion of the profits to those funds.

Mr. F. SWAFFIELD suggested that in future a percentage of the profits should be carried to those funds.

The CHAIRMAN pointed out that it was simply a matter of account; it was simply transferring a portion from the present large amount. However, the subject would receive the careful attention of the directors, who had no doubt put in force the power which the Articles of Association gave them.

A SHAREHOLDER asked whether the estimated profit for October had arrived?

The CHAIRMAN said the directors were expecting it daily. There had been some interruption of the telegraph service between San Francisco and New York.

Mr. J. P. G. SMITH then seconded the resolution for the adoption of the report and accounts, which was put to the meeting and carried.

The election of Mr. Thomas Eykyn to a seat on the board, in the place of Mr. Frederick Saunders, of Liverpool, deceased, was then confirmed.

On the motion of Mr. F. SWAFFIELD a vote of thanks was passed to the Chairman and directors, and the meeting broke up.

TECOMA SILVER MINING COMPANY.

The adjourned ordinary general meeting of shareholders was held at the company's offices, Palmerston Buildings, on Tuesday,

Mr. CHARLES C. ADLEY in the chair.

Mr. W. H. HARRISON (the secretary) read the notice convening the meeting, and the report of the directors, an abstract of which has already been published in the *Mining Journal*, was taken as read.

The CHAIRMAN said: We have met to-day, gentlemen, in order to comply with the provisions of the Joint Stock Companies Acts, and to complete within the year the annual general meeting which stands adjourned since March 8 last. That meeting, as you are aware, was adjourned *sine die*, no accounts being forthcoming from America. Subsequently, an arrangement was made with Mr. Davis to hand over the mines to the company, which arrangement was agreed to at the meeting held on April 27 following. It is unnecessary to recapitulate the details of that transaction. We have applied for the accounts during the period of the Patrick management, but have not obtained them, and doubtless we shall have to take the settlement made with Mr. Davis in April last as clearing off scores up to that period. Since the mines reverted to the company the works have been carried on moderately, in order to avoid running into debt more than what was absolutely necessary. The chief point held in view has been to complete the main adit level, which is to cut the great lode some 500 ft. below its outcrop. That lode, we are informed, shows a width varying from 25 to 75 ft. on the surface, and if we cut it the same thickness at the point we shall now meet it, and obtain ore in quantity approaching in value what we understand has already been obtained in the upper and shallower workings, we have every reason to expect we shall possess a remunerative property. The expenditure on the works has amounted to about 1400*l*. for the past seven months, according to estimate, or about 200*l*. monthly. Within the last few days we have had a telegram informing us that sufficient ore had just been sold to cover two months' expenses. You will observe that the manager reports that with increased funds to enable him to double his force he could show better results, and it is advisable we should have the command of ample funds, not only to accelerate the development, but also to have the administration of your affairs more under control. Our present financial position is this—we have received about 1400*l*. from Mr. Davis, and ought to have now, by the recent sale of ore, about 400*l*. in hand. I take it that to place us in a proper position we ought to have about 2000*l*. at our disposal. This would enable us to pay off the advances, with interest, and leave us with some 800*l*. in hand for the works. But if we were to increase our force we should require from 2000*l*. to 3000*l*. more—that is to say, we should be able to rely on getting this extra amount if required. I have spoken to one or two influential shareholders on the subject, and am authorised to state that the sum of 500*l*. will be forthcoming if other shareholders will join in making up the necessary amount. I trust, therefore, that you will take this subject into your earnest and serious consideration to-day, and act decisively and promptly. We have sent out instructions to the manager to forward the accounts made up complete to the end of the current year, accompanied by a balance-sheet, profit and loss accounts, and detailed report. We have also desired him in future to make out accounts half-yearly, and forward them in time for our half-yearly meetings. We propose in future to hold these meetings in March and September, or so soon after as we conveniently can. This arrangement ought to allow ample time for placing the half-yearly accounts properly and regularly before you. There are several points in the administration of your affairs that give your board much anxious concern, but it is premature at present to enter into them. At the proper time, and in due course, they will be laid before you; and, meanwhile, we shall endeavour to discharge our duties in guarding your interests to the best of our ability, and in accordance with the means at our command. I have already remarked that it is advisable that the management of your affairs should be entirely under our control. This, we regret to say, is not now the case. We have done everything in our power to protect your interests, but we have had difficulties to contend against we did not anticipate. I need only refer you to the manager's letter now in your possession, and which speaks for itself. It contains its own commentary, and has, doubtless, afforded you an ample fund for criticism. I need only add that the promise therein made of a weekly report is not fulfilled, for three weeks have elapsed since it was received, and we have not heard anything further. In fact, our instructions are disregarded, and your board treated with a nonchalance the more humiliating because we are powerless to prevent it. And I am afraid this treatment, arising from a dual authority, will have to be submitted to so long as we are subject to obtain advances to carry on our work; because, while we are so constrained to act, the manager knows that we exercise but a visionary control over him. It is impossible that this state of things can continue. It is against all principle, reason, and experience. It is very unpleasant and unsatisfactory for us on this side of the table to have to submit to this *imperium ab imperio*, to find our orders treated as waste paper, and our authority set at nought. And I am very much afraid that unless there is some considerable amendment, or your board placed in a position to enable us to do our duty with justice to your interests and becoming dignity to ourselves, I, for one, shall be compelled at our next meeting to ask you to accept my resignation.

Mr. T. G. TAYLOR thought that Mr. Joseph Barker should be got rid of, as it appeared that neither from him, from Mr. Patrick, nor from Mr. Davis could they learn anything. He sympathised with the directors for the position they were in, but at the same time could not think how they could ask for money, considering the position they were in, or unless they pledged themselves not to take money from any shareholder who could not afford to lose it. He would ask had the mine ever been worked at a profit, and whether they were to believe that if the shallow workings did not pay better results were to be expected in depth? For his own part he did not believe a single statement that came from the other side.

The CHAIRMAN, in reply to Mr. Walker, stated that they could not discharge Mr. Barker until they had paid Mr. Davis the amount they owed him, and which was about 1400*l*. There was no reason for delaying the publication of the telegram last received. It was delivered to him on Nov. 30, and he did nothing with it until he had seen his colleagues, but it was then, although not considered of an important character, forwarded to the newspapers and published on Dec. 4.

Mr. WALKER considered it an important announcement, seeing that it stated that they had worked two months at a profit.

The CHAIRMAN considered that there was no doubt that the telegram meant that Mr. Barker had sold ore sufficient to cover two months' expenses, and that they were four months in arrear, he having been in possession as manager for six months.

Mr. WHITE thought it should be explained that the two months' ore was sold in consequence of an order sent out from the London office. Mr. Barker had been doing nothing but drive the tunnel, but the directors had two months' ore sold to test the value.

Mr. WALKER enquired what Mr. Davis had pledged himself to lend, and how the actions against the old directors were going on?——The CHAIRMAN explained that Mr. Davis was to lend 5000*l*., of which he had already lent 1400*l*. The action against the old directors was quashed, all matters in dispute having been settled in the final arrangement.

Mr. A. GRAY could not see the desirability of carrying on the concern unless they could get money and take everything out of the hands of Mr. Davis. To go on otherwise was simply playing into his hands.

Mr. R. ST. STEPHEN stated that during two months of his management a profit of 1000*l*. had been realised. He would remark also that no tunnels in the neighbourhood had been driven deeper than this.

Mr. WHITE said it seemed to him clear that Mr. Barker considered he was to confine himself to driving the tunnel, and was not to take out ore, so that they must not suppose that the two months' ore represented all that could have been got.

Mr. TAYLOR thought that Mr. Barker's object was to drive the tunnel for Mr. Davis's subsequent use.

Mr. WHITE reminded him that the report showed that Mr. Barker was of opinion that when they got the tunnel in they would at last get ore which would well repay them.

The CHAIRMAN said they would see that if they came forward with 2000*l*., and he was authorised by one or two large shareholders to offer 500*l*. of this if the remainder were forthcoming, they would have all in their own hands. They must remember, too, that the money which Mr. Barker was now spending was not theirs, but Mr. Davis's. They were, no doubt, in a humiliating position, but one of three things they must do—they must either let Mr. Davis find money, as he was doing at present; they must find money themselves: or they must wind up. It seemed madness to him not to let Mr. Davis go on. The main adit would give them 500 ft. of lode above them, and a mine which would, no doubt, last them some time—a mine which would pay them a moderate dividend, though the large amount of capital on which they had to pay might prevent its being a large one. If they were to take into consideration the winding up, a special meeting would have to be called for the purpose, but he did not think that anyone seriously entertained the idea.——The meeting was then adjourned *sine die*.

BLUE TENT CONSOLIDATED HYDRAULIC GOLD MINES OF CALIFORNIA.

A general meeting of shareholders was held at the offices, Austinfriars, on Tuesday, for the purpose of receiving the report of the directors and statement of accounts for the past year, the election of directors and auditor, and for transacting the ordinary business of the company,—Mr. J. COURTENAY in the chair.

Mr. W. J. LAVINGTON (secretary) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen, as the directors, in accordance with the notice given, will propose that this meeting be adjourned to Wednesday, Jan. 5, to give time for the accounts and statement of the expenditures in respect of the aqueduct to arrive from California, I do not intend to trouble you with many observations to-day as I shall have a better opportunity when the full accounts are before us. At our last meeting I expressed a confident hope that when we next met I should be able to announce the completion of the work then in hand—I mean the aqueduct. This work, so essential to the prosperity of the company, was finished last October, having taken us two years to build, for when I visited California last summer a portion of the flume had been constructed, while the long tunnel through solid rock at Sawmill Flat was begun the year previous. I cannot refrain here from saying that it is mainly owing to the untiring energy and watchful care under most trying circumstances of Prof. Price, our general agent in San Francisco, that we are in a position to-day to congratulate ourselves upon the completion of one of the most important works of the kind ever undertaken by an English company. By this aqueduct a large body of water will be brought from the South Yuba river, high up in the Sierra Nevada mountains, a distance of over 30 miles, to the company's property near Nevada City, while for many miles it has been constructed to carry a larger supply than we shall require for our own use, with the view of selling it to the neighbouring mines, so that in time we hope to be a water-selling as well as a gold-washing company. No one who has not visited the locality and seen the wild and mountainous district through which the aqueduct winds its course can realise what a costly and difficult piece of engineering it was to hew out of the mountain sides a secure bed for the flume, or wooden portion of the canal. It has cost much beyond the estimate, owing partly to the changeable character of the ground, and difficulties not sufficiently reckoned for in the preliminary surveys, and it has also been constructed of a somewhat larger size than originally contemplated. Having, then, finished the canal, it behoves us to pay for it with all speed, towards which object the debentures are being issued, and I take this opportunity of urging most strongly those shareholders who have not yet, either themselves or through their friends, taken up any debentures to apply for some without further delay. The rate of interest—12 per cent.—is unquestionably high, but the company can afford to pay it very well, for it has actually paid during the current year to another water company a larger sum than the whole of the debenture interest—3000*l*.—amounts to, and that for a scanty and insufficient supply of water, altogether inadequate for our requirements. The aqueduct, by ensuring a full and independent water supply, makes the property complete in all the essentials for successful hydraulic gold washing on a large scale, for we already possess a practically inexhaustible extent of rich auriferous gravel, and admirable outlets. With the knowledge of these facts I consider the debentures to be a first-class security, and do not hesitate to recommend them to my friends, especially as the total amount of the debenture debt is small. The bulk of the labour and materials used in the construction of the canal has been paid for, but there are still outstanding liabilities which must be discharged as soon as possible. However, our heavy expenditure is at an end, and we have but to work our property economically and with judgment, and each year will find it better opened and yielding larger returns, for we shall continue to improve our reservoir accommodation. The rains commenced in California the second week in November, and on the 17th of that month washing was resumed, and, judging from the weather we are having here, it ought to be a good time for the gold-washing business. We shall wash this season on three claims—the South Yuba, Enterprise, and Blue Lead or Blue Gravel claims, and I know of no reason why we should not now make handsome returns. I beg to move that this meeting be adjourned to Wednesday, Jan. 5.

Mr. FOOT seconded the proposition for the adjournment.

The proposition was put, and the meeting was adjourned to Jan. 5.

TREBEIGH CONSOLS MINING COMPANY.

A general meeting of shareholders was held at the offices, Crosby Chambers, on Wednesday.—Mr. JEHU HITCHINS in the chair.

Mr. WARD (the secretary) read the notice convening the meeting.

The CHAIRMAN said they were all aware the present meeting had been convened for the purpose of completing the necessary preliminaries for re-starting Trebeigh Consols Mine, of which he had had for many years the most favourable opinion. In the development of this property he hoped they would show to some people what could be done by a better management, and that satisfactory results

could be realised without incurring heavy expenditure. What had to be done they would endeavour to do without unnecessarily ornamenting the surface, but rather in prosecuting the underground workings. He thought it perfectly wise to work under the Cost-book System, as under it a shareholder could at any time determine his liability by relinquishing his shares; whereas under the Limited Liability Act a shareholder was liable to the full extent of the capital. It would be necessary at this meeting to appoint officers, and pass such other resolutions as were necessary for the future conduct of the mine.

Mr. HOLMES proposed that Messrs. John Hitchins, Pearce, W. S. Sutton, and W. Tankard be appointed the committee of management.—Mr. H. PEARSE seconded the proposition, which was put and carried unanimously.

Mr. H. PEARCE proposed, and Mr. FOSTER seconded, the proposition that a call of 1s. per share be made, which was carried, with the addition that a discount of 5 per cent. be allowed if the call be paid on or before Jan. 3.

Resolutions were also passed that all cheques on behalf of the company be signed by two members of the committee, and countersigned by the secretary, and the usual indemnification of the lessees acting on behalf of the company. The lease is held for 21 years, without any dead rent.

The CHAIRMAN said arrangements would be immediately made for opening out the fine lode already discovered in the adit level. To do this you must have an agent.

Mr. WARD proposed that Capt. John Gifford be appointed the agent, at a salary of six guineas. He had known Capt. Gifford for many years. He was a well tried man, and well known in the district, but no one knew Capt. Gifford's ability better than the Chairman. Capt. Gifford not only knew the mine well, but had been a large shareholder from the commencement.

Mr. SUTTON seconded the proposition. He also had known Capt. Gifford for some time, and he hoped the appointment would prove beneficial to Capt. Gifford as well as to the shareholders.

The CHAIRMAN said that Capt. Gifford had been associated with him for many years, and could bear testimony to his practical ability.—The motion was put and carried.

Capt. GIFFORD thanked the shareholders for the appointment, assuring them that nothing should be wanted on his part to promote the best interests of the company. His salary would be low, but having a most favourable opinion of the mine he should be induced to do the best for their mutual interest. He had every confidence the property would turn out well. If anything could be said for indications, in all his experience never had he seen anything so encouraging.

A vote of thanks to the Chairman closed the proceedings.

IMPERIAL BRAZILIAN COLLIERIES COMPANY.

The adjourned meeting was held at the City Terminus Hotel on Dec. 3, Mr. JOHN O'SURTEES in the chair.

The CHAIRMAN: As this is simply an adjourned meeting, it will not be necessary for me to occupy much of your time. Of course, you have all had the circulars that have been sent out, stating that this meeting is held in accordance with the wish of certain shareholders, with a view to see what would be the result of a last application to get more capital subscribed. I may at once tell you what has been the result. The number of shareholders in this company is 232. Of that number, 154 have never replied at all, representing as they do a capital of 59,200*l.* There are 32 who have answered refusing to subscribe, representing capital to the sum of 14,785*l.* There are 18 who have consented conditionally, but many of them attaching such extraordinary conditions that, in fact, they are virtual refusals. They represent a capital of 4194*l.*; and there are 28 shareholders who have consented unconditionally to subscribe, representing a capital of 6864*l.* Now, I think I should mention that at the last meeting the shareholders seemed to be divided into two parties—I may term them the "extreme right" and the "extreme left." The former were led by Mr. Webb, representing the original directors and the chief debenture-holders; and the latter were led by Dr. Godsall, representing a considerable section of the shareholders. Taking the "extreme right" first, the result has been this: Mr. Webb signed a paper to take his proportion, but he did so with a condition. He has answered since that he presumed that would have been taken as a consent. We expected everybody to sign from that side, and therefore we did not know how to put it down. However, he has told us since that he intends to subscribe. Mr. Petre, who advocated further subscriptions, has declined to subscribe. Mr. Burbidge has not replied. Mr. Ross, who was one of the former directors, and who, I believe, used to be a trustee for the vendors, has not replied; and neither has Mr. Pemberton. Mr. Brydges Willyams has never replied as to a fresh subscription, though Mr. Petre represented him. It is clear, however, that he received the communications, for he has consented to waive his interest as a debenture-holder for 12 months. Mr. Bower has sent an undecided answer, which is equivalent to a refusal, and Mr. Fowler has said he cannot subscribe. Of all those represented on the "extreme right" side, those that have subscribed are represented by Lord Bingham, 53*l.*; Admiral Hall, 35*l.*; and Mr. Boyle, 100*l.*, on an impossible condition. That condition is that the Brazilian Government take their 10 per cent. The total amount subscribed on that side of the room amounts to the sum of 88*l.*; and on the other side the amount of 784*l.* has been subscribed. The total amount which has been subscribed conditionally and unconditionally is 1400*l.* That is the result of the two sides of the room, and, of course, the shareholders will now be able to judge what to do better than they were at the last meeting, when they adjourned it to see what could be done to get fresh capital. Our proposal was to re-construct and to wind-up. When we found that it was the wish of the shareholders to continue the company we thought it our duty to answer those wishes by subscribing our proportion of the required capital. I want to say nothing at all unkind or harsh, or to make an unfair remark about anybody. There is one remark, however, I must make. At the last meeting I was asked whether Mr. Webb had been consulted before the scheme of the board was drawn up. I answered that we did not consult him, and as it seemed a very odd and unusual course, unless I explain it blame may be laid upon the shoulders of the directors. We passed a special resolution when we had to consider that question with reference to Mr Webb, but it was done in no offensive or hostile spirit to him. Mr. Webb was concerned with the promoters, and some of the former directors, and it was thought desirable that we should obtain independent legal advice in the matter. A resolution was consequently passed that Messrs. Merriman and Pike should be consulted. The only other thing that I need trouble you about is the matter of the concession. At the last meeting Mr. Webb very wisely and rightly said that we must be cautious, because if we wound up this company we might find ourselves in a difficulty, and forfeit the concession, because we might find we had not the means of doing it. Some time ago, on a board minute in August, 1871, Mr. Webb states there that he had laid this concession before the secretary of the legation in England, and after stating all the different points, he says—"The concession can be transferred by deed in accordance with our law." If that can be transferred once it can be transferred a dozen times, for our law allows it to be done as often as we like. I had a copy of the concession, which has been very kindly furnished by Mr. Webb. From a reading of it I have no doubt whatever that it can be transferred. The Government might have forfeited this concession over and over again, but they not desired to do so. It is quite clear that they do not want to forfeit it, but to help us all they can. Now, if they can see that by reconstituting the company the works would be carried out, they would see that it was to their interest to support it rather than to forfeit the concession. That being so, the board thought, and still think, the proper course to adopt is to liquidate the company with a view to reconstruction. Mr. Webb thought that our object at the last meeting was to liquidate pure and simple. Now that, as you know, was not so. I expressly stated that our view was to reconstitute. We have had a conversation with Mr. Webb since, and I know that he has an idea which very likely the shareholders will adopt, and which I do not think the board will oppose. All the board want is to do the best that is possible for the interests of the company. Our intention was to propose at once that the liquidation should take place to-day with a view to reconstitution. Before I do that I shall be glad if Mr. Webb would mention his views on the subject, and then we shall be able to hear what any shareholder may say, and shall be happy to answer any question that I can possibly do.

Mr. WALTER WEBB began by complimenting the Chairman on the tone of marked courtesy he had adopted towards himself. This enabled him to give those explanations which in the heat of a controversy were often made far from clear. The shareholders must bear this in mind, that the directors and Dr. Goodsall wanted to wind-up the company. It was he (Mr. Webb) who appeared on the scene at the previous meeting, not as a professional adviser, but simply in his capacity as a shareholder, to urge on all who felt interested in the company to do their utmost to extricate it from its present difficulties. He ventured to state honestly and fully his view as to the danger of the course which the shareholders were invited to take, and they should congratulate themselves upon having, at all events, secured the respite of a fortnight, during which time the directors had been enabled to tell them what result had attended their efforts to procure further funds for the company. His object at the last meeting was to point out that he thought the concession would be endangered by a winding-up. He, therefore, asked the meeting to pause before it committed itself to that step. The report of the directors, on which they were asked to proceed, stated that the reason for the shareholders winding-up was that if they did not wind themselves up the debenture holders would do it for them; therefore, the directors said they thought it necessary to go into voluntary liquidation. He pointed out that this object would not be attained, for the debenture-holders if they chose to act upon their rights, would be able to do so notwithstanding the voluntary liquidation. It was gratifying to him to be able to announce that to the extent of nine-tenths of the debenture debt consents had been given to the holding over the payment of interest for a period of 12 months. It was thus a matter of congratulation that the debenture-holders had in consequence of the adjournment consented to the extent he had named to hold over the enforcement of their claims for 12 months. He was sure the Chairman would do the "right side" the justice of saying that at all events the effect of the adjournment was to secure this important condition on the part of the debenture-holders, that they should virtually consent not to wind up the company. Hence the shareholders had breathing time allowed them. There was now no necessity to be in a hurry to wind-up voluntarily; and it was quite competent for the shareholders to look at the matter calmly and to see exactly what it was best to do, and to act without any fear from the debenture-holders. Of course the works would have to be kept going, and the manager and his men had to be paid. In accordance with the arrangement at the last meeting, an appeal had been made to the shareholders to supply the further funds required, the unsatisfactory result of which had been stated by the Chairman. The directors would, of course, not feel themselves justified in allotting the second debentures applied for, inasmuch as "the required amount had not been subscribed." These words constituted the sole condition upon which his subscription was made, and therefore it was hardly fair for the Chairman to suggest that his subscription was in effect conditional. Furthermore, the Chairman's reference to certain gentlemen by name was rather invidious, as most of those gentlemen had subscribed their names to the paper handed round at the previous meeting, and of course, as honourable men, they considered themselves bound by their subscriptions, and probably felt somewhat annoyed that any further written document should be placed before them for signature. In the Chairman's computations of the amounts subscribed on the two sides of the room, he had taken credit for all the amounts subscribed as the result of the adjournment, and twitted the Right with not having come forward in an equally liberal spirit. Now, he must deprecate the division of the company into sides. In the present emergency, unless all parties pulled together, the existence of the company would be imperilled, and he thought there was little yet for either side to congratulate themselves upon, although the work to be done left it open to both by harmonious and cordial action to bring about results which might preserve to the shareholders their property, and ensure to them the emoluments which were to be derived from the working of this most valuable undertaking. The views he expressed at the last meeting were in no way changed. To a winding-up of the company he offered his most strenuous opposition, because he believed such a step would endanger the concession of the Imperial Government; it would alienate the Provisional Government, and embitter the Brazilian shareholders, whilst, as to the English shareholders, they would not receive one shilling, because all the assets of the company would be required to pay the debenture-holders and the costs of the liquidation, it being now admitted by the directors that if the property be sold by the liquidator there is no probability of a sufficient sum being raised to pay off the debenture debt. Under these circumstances, was it not childish for the share holders to think of entering on the suicidal policy of winding up the company voluntarily. And as the only ground offered by the directors for winding up had disappeared in consequence of the adjournment which he was instrumental in carrying at the last meeting, there being now no longer any danger of winding up at the instance of creditors, the shareholders had an opportunity of calmly surveying the position, and determining what course would be the best to take. The Chairman had stated the result of a conversation that had taken place with him (Mr. Webb), and wished him to give the meeting the benefit of his views as to the right course to adopt. In the first place, the shareholders must bear in mind that they can do nothing without the sanction of the debenture-holders, who are mortgagees of the whole of the company's property: assuming, however, they were willing to come to reasonable terms, it would be for the shareholders to consider whether it is not desirable to re-construct the present company, so as to offer a greater inducement than at present exists to those shareholders who are so minded to bring in the necessary further capital to pay off the small amount of debt owing, to bore for a lower seam of coal, and if found to continue the present pit down to it. It appeared manifest that two-thirds of the present shareholders were lukewarm, or disinclined to subscribe any further capital, and it was natural that the one-third should hesitate when called upon to provide the capital, the benefit of which would be enjoyed by all the shareholders, whereas the loss, if any, would fall exclusively upon the section providing the capital. Now, it seemed to him (Mr. Webb) highly probable that it might be for the interests of the debenture-holders and those shareholders who were willing to find further capital that a reconstruction of the company should take place upon terms which would be alike satisfactory to both sections. He had given no consideration to the details of such a scheme, but what he proposed was that a committee of debenture-holders should be requested to meet the directors and to confer with them, with a view to settling a scheme for the reconstruction of the company, whereby the present debts may be discharged, and working capital provided. Whether such a committee would attain the object in view he could not say, but he would do all in his power to promote it, and at all events the shareholders could sustain no injury by the attempt being made, as it was in their interest, come what may, not to consent to a liquidation of the company unless and until a scheme of reconstruction be agreed on, and then only as a means of giving effect to such a scheme. A winding-up concurrently with, and as a means to a reconstruction of the company, would not be a liquidation within the meaning of his remarks at the previous meeting; and, doubtless, the consent of the Imperial Government would be secured to the assignment of the concession to the reconstructed company if no suspension took place in the works of the colliery, and if the position of the Provincial Government be duly regarded in the terms of reconstruction. He was pleased to find that the eagerness and zeal which seemed to characterise the shareholders on the "left side" at the last meeting in their efforts to wind-up the company, and thus destroy all hope of reconstruction, had given place to a more reasonable view of their duty in the interests of the proprietary generally, because it must be borne in mind that although the Chairman, in his opening speech at the previous meeting, alluded cursorily to a possible reconstruction of the company; the burden of his remarks and of those who followed him on the "left side" were in favour of a hasty and, as the speaker considered, an ill-advised liquidation, and he (Mr. Webb) begged distinctly to state that so long as the shareholders supported him in the course he had entered upon with regard to their interests he should resist to the last voluntary winding up the company pure and simple. He (Mr. Webb) regretted that it was necessary, in consequence of the Chairman having somewhat stepped out of his way by introducing personal matters, to delay them a few moments in offering, as he was able to do on the spur of the moment, a complete reply on the three heads as to which the soundness of his opinion, given years ago, had been called in question. As to the transferability of the concession, Mr. Webb stated that he differed from the Chairman in his view, and he still contended that the concession did not constitute a transferable interest. The letter to which reference had been made related to an interview he had had with the Brazilian Minister, to whom he had put the question—"Can this Imperial concession by transferred to the Imperial Brazilian Collieries (Limited), and will a transfer in the English form be sufficient for the purpose?" The answer was "Yes;" and he reported the result of his interview with the Minister to the company in the words of the letter read by the Chairman. The concession was granted to certain individual concessionaires, and to a company to be constituted by them. The company was constituted by the concessionaires, and the concession was transferred to such company with the approval of the Government, but that having been done the power to transfer was exhausted, and he looked through the concession in vain for words to indicate that the company to whom the concessionaires were at liberty to transfer the concession was in its turn to be at liberty to transfer it over again, and so on. He thought it was generally recognised that a concession in the form of that belonging to the company was not a transferable property in the sense that the company could sell it without the consent of the power that conceded the privilege, and he considered that such a consent might not be granted by the Imperial Government if the Provincial Government feeling themselves aggrieved should offer opposition, as was not improbable in the present case if a liquidation were to take place. It is true that the Memorandum of Association, adopting the usual form, gives to the company the power of selling all or any part of its property, but such a power can give the company no greater rights over property than it possesses, and cannot entitle it to sell property which is of an unsaleable nature. This would be prejudicing third parties, which is beyond the power of a company to do, as its Articles of Association, are merely the code of rules regulating the rights and liabilities of the shareholders of the company amongst themselves. The Chairman had also alluded to the non-registration of the trust deed for the benefit of the debenture-holders; and he called attention to the minute of the board, wherein it was stated that it was considered "undesirable that the deed should be registered at the present time." The trustees were the original chairman and one of the former directors. All the debenture holders were shareholders. The debentures contained a clause entitling the holders to exchange their debentures for shares in the company—an option which it was thought would probably be exercised, if Mr. Laity, who was then about to proceed to Brazil, returned with a favourable report; and it was thought desirable in the meantime to suspend the registration until Mr. Laity's return, he being requested to enquire as to the necessity for registration according to Brazilian law. Mr. Laity, whose favourable report upon the property the shareholders will remember, returned with the news that it was not necessary to register the deed. Accordingly its registration remained for some time in abeyance. He (Mr. Webb), however, more recently had occasion to consider the question of the registration of securities in the same province of Rio Grande in another matter, and he was advised that the necessity for registration did exist; and accordingly, inasmuch as the trustees had both retired from the board, he thought it his duty to write to the present directors a letter, to which reference had been made, calling attention to the fact that the deed had not been registered, and leaving it to the directors to consider whether it was their duty to register it. The directors replied that the trustees must attend to the matter, and under these circumstances the trustees thought it desirable to consult an eminent international lawyer, who advised that it was their duty to register the deed, and accordingly the trust deed was some time since sent out for for that purpose. With regard to all the matters to which reference had been made, the speaker could only say that if they occurred again he could only act precisely in the same manner as he had done. Upon the subject of his charges against the company, it must be borne in mind that the nature of the work he had for several years to transact was of the most onerous and expensive character, involving heavy payments out of pocket. His bills, however, were from time to time subjected to the closest scrutiny; they were passed by the shareholders in general meeting, after he (the speaker) had submitted to a very considerable reduction in deference to the wishes of the directors, who expressed their willingness to pay themselves the amount he took off, so satisfied were they that it was all legitimately earned. Under these circumstances, therefore, and as the Chairman had no connection with the company at the time to which the accounts related, it was uncalled for to refer to a subject which always tended to irritate shareholders, and which was calculated to prejudice the speaker in their eyes at the time when he was endeavouring to exert his influence for the preservation of their property, and for the very existence of the company. Having been the solicitor of the company from the first, and enjoyed the confidence of the different gentlemen who from time to time had sat on the board, and being now so generally supported by the shareholders in the views he was endeavouring to give effect to, he thought it is duty to enter at the great length he had done in order fully to state his views of the true policy for the shareholders to endeavour to carry out; and, furthermore, to afford every explanation in his power upon all matters in which he had been concerned.

Mr. BOWER said he was surprised to receive a notice from the directors asking for power to wind up this company. The debentures should have been taken in consideration before notice of such a resolution had been given. Reconstruction in his opinion, meant destruction. It not only meant an attempt to obtain further capital, but the absolute annihilation of those who, up to now, had borne the burden and heat of the day. What they really wanted was to discover a better seam of coal, but if they proceeded to reconstruct, they might possibly lose the concession. The Brazilian people had rights of which the shareholders had no knowledge, and which they would put into operation for the entire extinguishment of any rights they had. Reconstruction was also a very expensive operation. Now, let them turn their attention to the colliery. At a moderate depth they had a seam of 6 ft. coal. He had tested this coal and found it of excellent quality; but when brought to market, neither the Brazilian Government, the gas company, the various steamboat companies, nor the railway companies would repeat their orders. Unless, therefore, they could find a better seam of coal there was no help for it but to close the concern. But how were they to find the capital for that purpose? He thought the debenture-holders would be exceedingly injudicious if they did not do what the directors wished—to hold their hands and not claim any interest for the next 12 months. Now, he would make a simple boring of 50 or 60 yards. If at a depth below the present seam they could find another 4 or 5 or 6 ft. thick of better quality, then there would be a great future for the company. If, however, the Brazilian Company thought they were on the point of liquidation, they would sweep them out of existence. His advice to the shareholders was to go on for the present at all events.

The CHAIRMAN pointed out that the argument of Mr. Bower was exceedingly good, only the company had no money. There were debts on the other side possibly to the amount of 1400*l.*; the manager's salary was unpaid, and really without funds he did not know what to do.

Mr. BOWER estimated that it would cost 1000*l.* to carry out his recommendation with reference to the sinking.

Mr. MAUDE said it was impossible to do this with the response that the directors had had 1400*l.* in all, and 680*l.* conditionally.

The CHAIRMAN said the rough scheme that the board had thought of with reference to the reconstruction was that a new company should be formed, with a capital of (say) 50,000*l.*; the debenture-holders should be asked to take shares to the par value of their debentures with a preferential interest of 10 per cent.; the preference shareholders should come next, and take 20 per cent. of their present holding in shares at par, with a preferential 10 per cent. dividend, and the ordinary shareholders should take one-fifth of their holding, the only difference between the preference shareholders and the original shareholders being that they would have a preference dividend, but reducing it from 15 to 10 per cent. The capital thus raised would amount to about 26,000*l.* The capital called up would be about 8500*l.*, and there would then be about 15,000*l.* left to be allotted, and asked for eventually, should they find the thing likely to be a success. The 8500*l.* would allow them to pay off all their existing debts and the expenses of the reconstruction, and leave about 7000*l.* for the boring. The Diamond Rock Boring Company would do the work at a contract price.

The following resolution was then unanimously adopted:—"That the Chairman be requested to adjourn this meeting until immediately after the conclusion of a special general meeting to be held on Friday, Jan. 7, at two o'clock, to receive and consider a proposition for the reconstruction of the company, and that a committee, consisting of three debenture-holders, to be nominated by Mr. Webb, and a committee of shareholders, consisting of Dr. Goodsall and Mr. Maude be, and they are hereby appointed to confer with the directors upon a scheme of reconstruction to be recommended for adoption at the above-mentioned special general meeting."

On the motion of Mr. BOWER, the meeting closed with a cordial vote of thanks to the Chairman.

RUSSIA COPPER COMPANY.

A general meeting of shareholders was held at the City Terminus Hotel, on Thursday,—Mr. ALEXANDER BROGDEN, M.P., in the chair.

Mr. C. T. MOORE (the secretary) read the notice convening the meeting.

The report of the directors stated that the profit and loss account for the six months to Dec. 31, 1874, shows a loss of 8968*l.* 16s. 11d., while the profit and loss account for the six months to June 30, 1875, shows a loss of only 936*l.* 8s. 7d.; together, 6905*l.* 5s. 6d., as against a loss in the previous year of 18,105*l.* 5s. 11d. The principal cause of the loss on the half-year ending Dec. 31, 1874, was the excessive mining cost of the ore in the previous year, the stock on hand at June, 1874, having been valued at the average cost of the year ending at June, 1874, and consequently the manufacturing account of the half-year to Dec., 1874, was charged with the ore at that average cost. The profit and loss accounts of the year have been charged with 1000*l.* written off from the amount standing at the debit of preliminary and other expenses, and chargeable to the profit and loss by instalments. The only additions to capital expenditure during the year amount to 212*l.* The company's operations generally in the half-year ending June 30, 1875, still suffered from the want of funds in the previous year, sufficient preparatory work not having been done to keep the smelting works at Voskresensky in full work during the whole of the half-year. The operations of the half-year also suffered from other two causes, which the directors believe will not occur again—1st. The smelting at Preobrajensky resulted in a loss of 783*l.* 7s. 10d. in consequence of the experiments referred to in last year's report, when put to a fair trial, not turning out as was anticipated.—2nd. The Orenburgh establishment for sale of timber shows a loss of 360*l.* 12s. 8d., no sajen wood having been floated in the spring of 1874, the stock on hand of that wood at June, 1874, was the balance of the floating in 1873, and was valued at cost price, which, from the causes mentioned in last year's report, was excessive. The value of the whole of the company's properties may be considered to be free for the shareholders, subject only to the 7616*l.* excess of liabilities over floating assets. These properties consist of freehold lands, including minerals (all forest), 319,188 acres; freehold lands, including minerals (not forest), 128,187 acres; mining rights in Crown lands, smelting works at Voskresensky, smelting works at Preobrajensky, and the Orenburgh establishment. The natural increase in the value of forest estates, such as the company's, now going on in Russia, coupled with the enhanced value which will accrue to the company's estates on the opening of the railway to Orenburg in Nov., 1876, and the construction of the Government line beyond, now in contemplation, must add greatly, ultimately, to the value of the company's shares. The directors also believe that the results of the company's operations for the year now current will show a marked improvement, and will continue to improve steadily year by year, and they, therefore, with confidence recommend the shareholders to retain their shares. To meet the 7600*l.* of debentures falling due on July 1, 1876, and other requirements, the directors are prepared to receive applications for debentures for 10,000*l.*, carrying interest at 8 per cent. per annum—20 per cent. to be paid on application, and the balance at any dates which applicants may specify, not later than July 1, 1876. Up to Feb. 1, 1876, applications will be entertained from shareholders only, after that date the balance of the 10,000*l.* not taken by the shareholders will be allotted to other applicants.

The CHAIRMAN having referred to the lamented decease of his colleague, the Right Hon. T. E. Headlam, and the unavoidable absence by indisposition, of Mr. Mundella, M.P., stated that at the last meeting the shareholders were informed that from the information the directors possessed of the working of the company they believed they would be able to present, at any rate, a better appearance at the next meeting; but at the same time he frankly and candidly told them the improvement could not be expected to apply to the half-year then about to terminate, ending December last. The manufacture of copper was carried on under the disadvantage of having taken over a previous excessive cost, and he did not expect that the result of the half-year could result in anything but a loss. But an improvement had taken place in the second half-year, and no small improvement to have effected a difference between a heavy loss and a comparative balance of accounts. Of the balance of loss 500*l.* was to be attributed to charges which, in the opinion of the auditor and some of the directors, were properly chargeable to capital in reduction of outlay account of previous times, and 700*l.* was attributable to experiments commenced and were then being continued at Voskresensky. They had endeavoursd to take a most careful valuation of the stocks; the stocks had been valued at a price that had yielded a substantial sum in excess of the estimate, and 360*l.* had been written off from the bad floating of two years previously. If all those items had been taken into account the accounts would have shown a profit instead of a small loss. The report was so full with respect to the prospects of the undertaking that he need only interpret a few of the leading features. The quantity of copper raised at Kargalinsky during the year ending June was 642,298 poods, equal to 400 tons of fine copper, and sufficient to keep the furnaces at Voskresensky at work during the whole year. That was very much in excess of previous years, and they did not see anything to prevent them during the coming year—so far as ore was concerned—keeping the furnaces going during the whole year. There might be some difficulty with reference to charcoal, because last year was a very short season, and they were unable to get as much charcoal burned as required for smelting purposes throughout the year. But they had adopted a remedy by making charcoal in advance, which should prevent further difficulty with reference to that portion of their business. This year the transport of ore had commenced very well, and as far as could be judged there was no reason why there should not be a full supply of ore for consumption, and maintain the stocks for the following year. At Preobrajensky they had not been so fortunate; the cost of transport had been higher than anticipated so far as the ore was concerned; in smelting some were found refractory, and required a certain admixture of ore from the permian country; even with a reduced price of copper they could clearly see that Voskresensky smelting by the ordinary plan would have resulted in a profit. They had another process, by means of a reverberatory furnace, which had cost 700*l.*, which did not succeed. After a good deal of anxious enquiry they had opened out some mines yielding the same character of ore near the Ural river, where the carriage was less, and they did not see any reason why they should not proceed more favourably than hitherto. In the second half-year there had been a diminished cost in the production of copper of 23*l.* per ton, and although it had been sold at 5*l.* per ton less they stood in a much better position than before. Upon the question of timber, which last year they had stopped floating in consequence of the losses resulting, he mentioned they had commenced again; after much consideration, they had determined to commence floating to a certain extent, and he was glad to say this had been done very successfully. The assets of this year's floating had not come into this year's accounts at all, because the timber brought down in the summer was not sold until the succeeding season, therefore although this department had yielded a profit it would not be shown until next year. They had sold a considerable portion to the railway company, who were making great progress in the neighbourhood; they had resolved to continue the timber business upon about the same scale as at present, gradually extending it as necessities required, or as their power to manage it increased. Upon the question of farming, which was carried on in connection with a mining establishment, a close analysis of the accounts showed that the farm had been charged with loss on horses, storekeepers, and other things which should be apportioned between it and the mines, but the two were looked

upon as one establishment, and it was a matter of arbitrary regulation as to which account the charges were put to. Everything was taken out at cost price, whereas the farm only got the benefit of the small profit in the sales to the workmen in the supply of their food. In time the former ought to be a matter of considerable profit, seeing that the fine land would be soon placed within 20 miles of railway. The Darghina farm appeared to yield only a small profit, but that was because there was so much of the old stock in hand, which was taken at a very moderate price, but would realise a considerable sum of money when sold in the autumn. They held in stock about 3000 tons of grain, rye and wheat, principally rye. With reference to the reduction of the ores by the wet process a considerable sum had been expended in making trials, so as to ascertain in a conclusive manner whether they had any ores that could easily be reduced by that process; the result had been most satisfactory, as at the Ural river they had a mine yielding a rich percentage of copper pyrites, from which were obtained their sulphuric acid at a moderate cost; it was an immense deposit, very easily worked, and very little transport. He looked upon this as a most important feature in the future history of the country—as important, indeed, as almost anything else. The directors and managers had placed before the shareholders in as concise a form as possible the total liabilities of the company and its floating assets. The liabilities at the formation of the company were beyond its share capital 30,000*l.*, and Russian mortgages 30,000*l.* Since that time the debts had been increased by the issue of debentures to the amount of 24,000*l.*, and some further indebtedness running up the total to 90,000*l.* Against that there were floating assets consisting of stocks, copper, &c., amounting to 57,000*l.*, and the cash in hand, with amounts owing to the company, moveable plant, &c., brought up the amount to 82,000*l.* So that, within about 8000*l.* they were financially free, whereas against that amount they had very large properties, consisting of 445,000 acres, always increasing in value, and more so at the present time in consequence of the approaching completion of the railway; they also had valuable mines, which he had no hesitatation in saying represented a very large portion of the whole value of the share capital; they also had smelting-works at Voskresensky and at Preobrajensky. So that they could pay off every debenture, every debt of the company, and discharge every liability of the company within 8000*l.* The directors propose to issue debentures to the amount of 10,000*l.*, to replace the 7600*l.* falling due in next July, leaving 2400*l.* to carry out the acid process, which would prove so valuable an adjunct to the company. The object the directors had in view was to promote the interests of the company. His faith remained just the same as it ever had been; he had never sold a share, and looked with confidence to the time when they would be realising most satisfactory results. He then moved that the report and accounts be received and adopted.

Mr. G. Anderson, M.P., seconded the proposition, adding that the balance-sheet for the last half-year had been nearly squared. They had had very great difficulties to contend against, but he thought they had now got over them. If the shareholders were content to allow the directors to go on with the same policy as hitherto he thought they would very soon be in a different position. They had undoubtedly a splendid property, which was becoming every day more valuable. When the railways began to develope the resources of the company's property it was difficult to say how far the development would go. The prospects were most encouraging, and he thought it would not be long before the shareholders would have no reason to regret holding their shares in the company.

Mr. Chester moved, as an amendment, that the report be received with disapprobation.—Mr. Laity seconded the amendment.

Mr. Redmayne could not see any advantage to be gained by reflecting upon the past; all it did was to damage the property in the eyes of the public. He was no partizan, but was prepared to sink or swim with the enterprise.

Mr. Miller referred to the increasing value of the company's lands, and mentioned that the Russian Government had resolved not to grant any more concessions, so that the company's 400,000 acres of woods deserved to be considered a very valuable asset.

The Chairman, in reply to various questions, said it was difficult to understand the reason inducing Mr. Chester to come to these meetings to create discord, as he held but two shares in the company. As to the cost of producing copper, the saving of 23*l.* per ton referred to the half-year; upon the year the difference of cost would have been considerably greater, and they were working upon that level now. As to the labour question, he could not do better than refer to the statement made by Mr. Rickard, who states that our position as to labour is already incomparably better than it was in the previous years, and there is, unquestionably steady though, unfortunately, much too slow improvement. They have not much trouble now in getting the requisite number of workmen for the mines, and, for the scale of operations hitherto conducted, it would not be difficult, if due performance of engagements could be relied upon, to find an adequate number of workpeople for every department. It will, indeed, be a real boon to the company, the value of which could not be overrated, if, as is expected, the change in the police and judicial administrations about to take place bring with it the improvement required in the observance of contracts. It would at once remove the most serious drawback to the business, and relieve the management of the greatest source of trouble and anxiety. In fact, this change would contribute more powerfully than any other to the improvement and extension of the business generally, and of the copper in particular. Some of the company's miners left us for the railway works, but after a short trial there, not finding that conditions offered them sufficient inducement to remain, they have come back and resumed their work at the mines. The railway contractors have, in their turn, had to encounter the same evils in respect to workmen as those from which the company's business, and all similar interests in this part of the country, have so severely suffered and are still suffering; but in the case of the railway the authorities did not allow enterprise to perish for want of decision, but found a speedy remedy by applying special repressive measures, and called out the military to enforce them. It is somewhat puzzling to find that under an enlightened Government help should be so persistently refused to an ancient metal industry while it is readily given to railway contractors.

The Chairman, in reply to further questions, said the board had written to a few of the largest shareholders, in reply to which they had had responses equal to one-half of the capital of the company, and it was a very great pity that a shareholder with two shares only should be allowed to attempt to depreciate the value of the property.

Upon the amendment being put very few hands appeared in its favour, when the resolution adopting the report and accounts was put and carried.

Upon the proposition of the Chairman, seconded by Mr. J. E. Bartlett (a director), the re-election of Mr. Anderson, M.P., as director, was unanimously agreed to.—Messrs. John Ball and James Glegg (Messrs. Quilter, Ball, and Co.) were re-elected auditors.

A vote of thanks to the Chairman and directors concluded the proceedings.

SOUTH TOLCARNE TIN MINING COMPANY.

A general meeting of shareholders was held at the offices, Austinfriars, on Monday,—Mr. Clark in the chair.

Mr. Hickey (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The accounts, made up to the end of October, showed a debit balance of 150*l.* The report was read, as follows:—

Dec. 4.—In the 40 we have intersected a lode at a distance of 13 fms. north from the engine-shaft, which is very nearly in the position in which we should find Fraser's lode, but it is very different in composition, for instead of yielding copper ore, as at the levels above, the lode we have just cut through produces rich tinstone, and no copper; it is 3 ft. wide; and, as far as we can judge, by merely cutting through it, and before opening east and west into it, is worth about 20*l.* per fathom. We have cut into the granite to the north of this lode 4 ft., with the idea that there may be another lode, or part of the lode, still before us, and shall continue driving the cross-cut until the end of this month—that is, for a week longer. We then purpose commencing to drive east and west on the lode already cut through, shortly after which we shall be able to speak with more confidence as to its value. At present, however, it seems to be a good discovery. In the 30, east of cross-cut from engine-shaft, we have driven 9 fathoms, in which Fraser's lode has varied from 5 to 2 ft. in width, and produced some very good copper ore, but not enough thus far to be worked profitably. In the 30, west of cross-cut, we have opened through the same lode to the extent of 5½ fms, in which the lode has an average width of about 5 ft., and has also yielded copper ore of an excellent quality, being worth for a short distance about 15*l.* per fathom. We intend commencing a trial rise in the back of this level in the best part of the ore ground at once. In the next month we intend to commence making the necessary preparations for sinking the engine-shaft below the 40. The rock is favourable for progress, and should it continue as good in this respect as in the present bottom of the shaft we shall reach the 50 in four months, where it seems likely, as we shall be approaching the granite and the junction of the engine lode with other lodes, discoveries of greater value than any we have yet made will be met with.—Jos. Vivian and Son, James Paull.

The Chairman said the statement just submitted was the most satisfactory they had been able to show for a long time past, inasmuch as larger returns of ore were now being made than hitherto; it was also cheering to find that the lode had been cut in the 30 and 40 fm. levels, with every prospect that it would soon enable them to increase the returns; at the 40, where it had been just cut, it had most encouraging indications. There seemed no doubt that before long some important improvements would take place. During the period of depression through which they had been passing it had been deemed desirable to reduce every item of expenditure as much as possible, and the sinking of the shaft had been suspended. The latter work would shortly be resumed, in order to test the value and capabilities of the mine.

Mr. Hickey, in reply to a question, stated that the point had arisen whether the lode cut in the 40 fm. level was not a branch of the South Condurrow tin lode.

Mr. A. Thomas said it was very seldom a lode so suddenly changed, seeing it was a copper lode cut in the 30, and that cut at the 40 was wholly tin; therefore, it would appear to be another lode or branch.

The accounts were passed and allowed, and, with the report, were ordered to be entered on the minutes.

A call of 3*s.* per share was made.

The committee of management were re-elected.

A vote of thanks to the Chairman concluded the proceedings.

NANT-Y-GLO AND BLAINA IRONWORKS COMPANY.

A general meeting of shareholders was held at the City Terminus Hotel, on Wednesday,—Mr. Hugh Mason in the chair.

The report stated that the losses under the management of the former board amounted to 36,418*l.* This loss has been reduced to 13,290*l.*, being the amount now standing at the debit of profit and loss account. The amount of 11,530*l.* recovered by the company, after payment of costs, for damages consequent upon Messrs. Bird's cancelment of their contract for iron rails, by no means covers the heavy loss sustained by the company. To enable them to deliver Messrs. Bird's rails within the stipulated time they declined many orders for quick delivery at prices much higher than they subsequently realised. Messrs. Bird's rails would have kept their mills in full work for a period of several months, during which prices rapidly declined. They have continued their efforts to make the sale of coal the principal trade of the company. During the year 559,000 tons have been raised, and if the accumulation of small coal could be avoided by greater activity in the iron trade (and the consequent consumption of the small coal), the general result of the coal trade would be more satisfactory. A year ago they valued their stock of small coal at 4*s.* per ton. They now value it at 2*s.* 6*d.* per ton. The difference in the two valuations makes a loss of 4200*l.*, which falls on the past year. The stock of small coal is 56,000 tons.

Considerable expenditure has been made in erecting apparatus for washing small coal. They are now in a position to wash large quantities, and they anticipate that it will thus be made a marketable commodity. The apparatus for washing small coal enables them to produce a superior quality of coke. They have already obtained sample orders for coke, and they hope to make it an important branch of their trade. The extreme depression in the iron trade has rendered it impossible to keep their mills in full work. The quantity of finished iron sold during the year has not exceeded 27,500 tons, or an average of 550 tons per week. Notwithstanding the exceedingly low prices ruling for rails, there is scarcely any demand, and the closing of their ironworks for a time may become a necessity. They entertain a very decided opinion that the constant tendency to increase the capital account requires to be jealously watched, and that all outlay should be debited to revenue, unless most clearly and undoubtedly chargeable to capital. The reverse course may show matters to seem delusively pleasant for the moment, but only at the cost of augmented difficulties in the future. Acting upon these views, a considerable sum had been charged to revenue in the past year for expenditure which is often charged to capital. This expenditure has been upon improvements of the property, and in opening up coal workings, of which future years will have the benefit. In the carrying out of this principle they have debited revenue with upwards of 4000*l.* After passing through a year of unexampled depression and disaster in the coal and iron trades they regret to have to conclude their report without being able to announce any immediate prospect of improvement. Present prices of coal and iron leave no profit. Judicious management and economy may avoid serious losses similar to those already known to have been sustained by companies engaged in the same trade. They trust that, however disappointing the absence of a dividend may be, the conduct of their business with so small a loss as 1741*l.* 12*s.*, under the trying difficulties by which it had been surrounded, may be considered by no means discouraging.

The Chairman said his colleagues had unanimously requested him to preside over the present meeting as the late Chairman had withdrawn from the board; he was at present on a bed of affliction, suffering from a malady of a most dangerous character. During the past year they had had to struggle with difficulties of an unexampled character. Since the present board came into office they had had to face a continual reduction in the price of both coal and iron, and during the period of a constant reduction of value it had been almost impossible to secure any orders. The iron trade of South Wales was in a state of stagnation, and in securing orders they had to face so much competition that sometimes it left them without any profit at all. Then came the question whether they should take unremunerative orders or close their works, and so sustain a serious loss, and the board unhesitatingly had decided upon adopting the former course. The time, however, might be at hand when there would be no alternative but to close the works, and should they be driven to take such a step the shareholders might rely upon it that it would be for the best interest of the company that it should be done. In 1873 they raised 396,000 tons of coal; in 1874 they raised 435,000 tons; and in 1875 the raised 560,000 tons. So that it would be seen they had striven to develope their great and valuable coal field. There was great competition for orders for coal, as severe as the competition for orders for iron, and in proportion as the iron trade got worse so the coal trade must get worse also. Notwithstanding the severity of competition, they had increased the output, and would strive to increase it, as they had all the appliances for bringing their output up to 750,000 tons per annum. Referring to the balance-sheet, he pointed out that the amount of 240,000*l.* appeared as loans or mortgages; during the past 12 months they had been able to reduce the mortgage debt of 15,000*l.*, and, of course, as they reduce their mortgage indebtedness they improve the value of their property, and he hoped that during the ensuing 12 months they would be in a position to make a still further reduction. There was an item in the accounts of 29,000*l.* as owing by the company. When the present board came into office, in 1873 the amount owing was 77,000*l.* Thus the reduction of indebtedness gave the board great pleasure, as the benefit to the company by their having placed themselves on the ready money basis was not to be measured by the difference between 77,000*l.* and 29,000*l.* The item of 28,400*l.* for railways, tramways, wagons, horses, &c., stood at 176,900*l.*, against 155,000*l.* last year. This increase he accounted for by stating that they had 500 coal wagons now, whereas when they came into office they had not one; and that during the year they had improved the permanent way, their locomotive power, and their works generally. Their business had been conducted during the year without a shilling of bad debts. The cash in hand was now 52,000*l.*, against 22,000*l.* when the present board came into office. Referring to the profit and loss account, he went through most of the items of expenditure, for the purpose of showing that the board was exercising the strictest economy in all their operations, and in proof of this he further mentioned that they had recently been under the necessity of discharging 400 men at their works. He then moved that the report and balance-sheet be received and adopted.

The motion was duly seconded.

Mr. Davis called the attention of the Chairman to the fact that he had omitted all reference to the Chancery suit, a matter in which the shareholders felt considerable interest.—The Chairman said he had purposely omitted the subject. The work was going on, and any information he could give to the shareholders privately as his co-partners he would be happy to let them have, but he did not think it would be politic to make any statement with reference to it in public.

The report was received and adopted.

The retiring directors were re-elected.

A vote of thanks to the Chairman and directors closed the proceedings.

WEST GODOLPHIN MINING COMPANY.

A general meeting of shareholders was held at the offices, Great St. Helen's, on Tuesday, to receive the manager's report of the operations carried out during the past four months, and to examine and pass the accounts,—Mr. R. Wilson in the chair.

Mr. Charles Thomas (the secretary) read the notice convening the meeting. The accounts showed a credit balance of 410*l.*

The report of the manager was read, as follows:—

Dec. 4.—I herewith hand you a statement of work done in the past four months, the distance driven in the different levels, depth of winzes and shafts to the present date, with the value of the lode in the different pitches:—Work done in the past four months: The 60 has been driven south of Pressure shaft, on the counter lode, 4 fms. 2 ft. 1 in. The 60 has been driven east of the caunter, on Wilson's lode, 15 fms. 4 ft. 3 in. The 60 has been driven west of the caunter, on Wilson's lode, 10 fms. The 50 fm. level has been driven east of the caunter, on Wilson's lode, 13 fms. 1 ft. The 50 has been driven west of caunter, on Wilson's lode, 13 fms. 3 ft. The 40 has been driven east of the caunter lode 14 fms. 3 ft. The 40 has been driven west of the caunter, on Wilson's lode, 9 fms. 1 ft. The 30 has been driven east of the caunter lode 12 fms. 2 ft. 11 in. The 20 has been driven east of the caunter, on Wilson's lode, 5 fms. 3 ft. 6 in. The 10 has been driven east of the caunter, on Wilson's lode, 10 fms. 2 ft. 8 in. The adit level has been driven east of the caunter, on Wilson's lode, 5 fms. 2 ft. 3 in. Boulton's shaft has been sunk from surface 14 fms. 3 ft. No. 1 winze, in the 30, east of the caunter, on Wilson's lode, has been communicated with the 40. No. 2 winze, in the 30, east of the caunter, Wilson's lode, has been sunk 4 fms. 3 ft. 9 in. No. 1 winze, in the 40, east of the caunter, on Wilson's lode, has been communicated with the 50. No. 1 winze, in the 50, east of the caunter, on Wilson's lode, has been communicated with the 60.—Value of the lodes, distance driven and sunk: The caunter lode in the 60 fm. level, driving south-east of Pressure shaft, is 1 ft. 8 in. wide; low-price tinstuff, distance from Pressure shaft 35 fms. 1 ft. 6 in. Wilson's lode in the 60, driving east of the caunter, is 3 ft. wide; worth 10*l.* per fathom; distance from caunter 23 fms. 1 ft. 3 in. Wilson's lode in the 60, driving west of the caunter, is 4 ft. wide; worth 25*l.* per fathom; distance from caunter 11 fms. 4 ft. 6 in. Wilson's lode in the rise in the back of this level is 4 ft. wide, worth 20*l.* per fathom; distance raised 1 fm. 1 ft.; suspended for want of ventilation. Wilson's lode in the 50, driving east of the eastern part of the caunter, is 1 ft. 6 in. wide; worth 3*l.* per fathom; distance from the caunter 27 fms. 4 ft. 6 in. Wilson's lode in the 50, west of the caunter, is 4 ft. wide, worth 15*l.* per fathom; suspended while a winze is being sunk to communicate with the rise in the 60; distance from the caunter 14 fms. 5 ft. 3 in. Wilson's lode in the winze sinking in the 50, west of caunter, is 4 ft. 6 in. wide; worth 25*l.* per fathom; sunk 4 fms. 1 ft. 6 in. Wilson's lode in the 40, driving east of the caunter, is 2 ft. wide; worth 7*l.* per fathom; distance from the caunter 34 fms. 2 ft. Wilson's lode in the 40, driving west of the caunter, is 2 ft. wide; worth 3*l.* per fathom; distance from the caunter 14 fms. 3 in. Wilson's lode in the 30, east of the caunter, is 2 ft. wide, worth 4*l.* per fathom; distance from the caunter 27 fms. 3 ft. 6 in.; suspended while a rise is being put up to the 20. Wilson's lode in the rise in the 30, east of the caunter, is 2 ft. 6 in. wide; worth 5*l.* per fathom; raised 1 fm. 2 ft. 8 in. Wilson's lode in the 20, driving east of the caunter, is 2 ft. wide; worth 4*l.* 10*s.* per fathom; distance from the caunter 18 fms. 3 ft. Wilson's lode in the 10, driving east of the caunter, is 1 ft. 8 in. wide; worth 4*l.* per fathom; distance from the caunter 20 fms. 4 ft. Wilson's lode in the adit level, east of the caunter, is 1 ft. wide, low price tinstuff; distance from the caunter 40 fms. 3 ft. 8 in. Wilson's lode in the adit level rising against Boulton's shaft is 1 ft. wide, low price tinstuff; raised 1 fm. 3 ft. Wilson's lode in the stope in the 40 east is 4 ft. wide, worth 10*l.* per fathom.

The Chairman congratulated the shareholders upon the improved prospects of the mine; it would be seen by the accounts the four months' operations had resulted in a profit of nearly 400*l.* There had been sold 40 tons of tin and 10 tons of copper, 5 tons of which were sold before the previous meeting. Under the old lease the dues were 1-16th, but under the new they were 1-20th; during the time tin was low in price the Duke of Leeds was liberal enough to forego the royalty for six months, after which the royalty was 1-40th. Had the shareholders not been met in this way he (the Chairman) should have abandoned his shares, and as he held one-third of the mine he concluded the operations would have been discontinued had he taken that course. He knew that in another district the lord, through not acting liberally with regard to the dues, was injuring his property. He had no doubt if the lords would but act with more liberality a much larger number of mines would be worked. As he had already said, West Godolphin had a liberal lord, by which the shareholders had been encouraged to develope the property. As to the workings it should be mentioned that nearly all the tin raised during the past four months had been from drivings and winzes, the ground stoped having only been a few fathoms. There were something like 3000 fms. of stoping ground to come away, and nearly the whole of it could be stoped profitably. Even with the present price of tin a small profit was being realised. If tin now realised its former price—70*l.* to 80*l.*—this mine would now be paying good dividends. He, then moved that the accounts be passed and allowed, and, with the report, entered on the minutes.

Mr. Bolton seconded the proposition, which was put and carried unanimously.

Mr. Charles Thomas, in answer to questions, stated that in order to cut Wilson's lode at the next level below the 60 a distance of 33 fms. would have to be driven from Pressure shaft; that is, provided the underlie of Wilson's lode did not change. This 33 fms., however, would not be driven in dead ground, but would be extended on the caunter lode for the whole distance, and as the 60 fm. level was rich, no doubt the 70 would produce tin to pay well for the driving. The 60 fm. level is 60 fms. below the deep adit, or 100 fms. from surface. It was proposed to sink Boulton's shaft, and communicate it with the different levels with all dispatch, in order to give ventilation and to increase and improve the means for drawing the larger quantities of tinstuff which would be stoped in the various levels on Wilson's lode.

The accounts were passed and allowed.

A vote of thanks to the Chairman concluded the proceedings.

WEST CRAVEN MOOR LEAD COMPANY.

At the meeting of shareholders last week Mr. Granville Sharp (the managing director and secretary) read the following directors' report:—

The meeting of to-day is, as you are aware, a statutory one, agreeably to Act of Parliament, it being required to be held, as it is now four months since the incorporation of our company; the directors having to give an account of their stewardship, and supply their fellow shareholders with necessary information. Your directors are much pleased on account of having nothing to submit but what is of the most satisfactory import. In the first place they have to state that the 1200 10*l.* shares are all placed, with the exception of 150 which it is not intended to allot—that is to say for the present, as the capital subscribed is, according to present important discoveries and prospects, more than sufficient to establish the company in a good paying position. By reserving these 150 shares (representing 1500*l.* of the company's capital) there will be so many less to divide profits. This policy the directors hope will meet with the approbation of the shareholders. The directors would not regret double the number being unallotted, for with the important discoveries made, the very good prospects presented, and it may be said the certainty of a much more productive course of lead being soon opened out by the Blackhill adit level, it is to be confidently relied upon that West Craven Moor will, before long, be making its appearance in the Dividend List. The Blackhill adit east (a trial of primary importance, as to be presently explained) is driven about 700 fms. on one of the many lodes traversing the entire length of this property. By its extension, and cross drivages therefrom north and south, the whole of the lodes will be intersected, and the mine, with not less than 12 lodes, from 40 to 50 fms. deep, will be worked without the aid of any pumping machinery; this deep drainage level, therefore, being of paramount importance, it being indeed the main working medium of this property, ensuring the most expeditious, effectual, and cheapest possible development of its many lodes. In support of the opinion just expressed, that a much more productive lode will soon be opened out by this level, it has to be stated that upon being driven about 10 or 12 fms. further east it will be under what is known as Ashworth's Ground, from which Ashworth and Co's workers got and sold 40,000*l.* worth of lead; working the lode from the surface so deep as practicable with their inadequate means and appliances, but to comparatively little depth only for want of the requisite pumping machinery, which alone prevented their doing more. When the level in question is driven the distance mentioned this ground (Ashworth's) will be drained, admitting of being worked dry and to the best advantage and judging by what Ashworth and Co's partners were able to do (not forgetting the great disadvantages under which they must have laboured), there is every reason to believe that we shall do much better; relying also on the lode being more productive at the increased depth that we shall be able to work it. This is only one of the many important points of development that we have in view. Two other important points are the shafts known as the New East and New West shafts, which were only sunk 9 and 6 fms. respectively when this company was incorporated. The eastern shaft is now sunk cased, and divided to the depth of 17 fms., and is sinking for a 20 fm. level, which will be driven east and west on the lode; its present value being 20*l.* per fathom. The western shaft is down about 10 fms., and will also be sunk to a depth of 20 fms. for the next level; the lode being worth about 2 tons of lead ore to the fathom. The shafts are 43 fms. distant from each other, and are sunk on two distinct lodes, which according to their present underlie will be together in depth; and in extending east from the western shaft and west from the eastern one the 20 fm. level drivages will communicate, opening out profitable ore ground, with 20 fms. of backs (dry ground) for 43 fms. in length. Large returns of lead will then be made, satisfactorily progressive returns being already made. Looking at the position of this property (West Craven Moor) there is much reason to be satisfied therewith, seeing that it is in the midst of mines that have not only done well, but are still making very large returns. For instance, westward there are the celebrated Grassington Moor Mines of the Duke of Devonshire, which have been working for over 50 years having it is said, given his Grace as much as 70,000*l.* profit in one year. To the north and east of West Craven Moor are the celebrated Cockhill and Sunside Mines which have been working for centuries, some of the lodes producing, in places, as much as 8 tons of ore to the fathom. Several miles of levels have been driven on these lodes, so wonderfully productive have they been. The returns and profits of these mines have exceeded (that is to say, in gross) those of the Grassington Moor. Several of the lodes of Cockhill and Sunside Mines traverse Craven Moor. We do, indeed, consider that there are good grounds for congratulation on account of possessing such an undoubtedly very valuable property, being decidedly of the opinion that West Craven Moor will prove one of the greatest and richest lead mining properties in the kingdom. If there any questions to be asked the directors will most willingly reply thereto. It is customary at statutory meetings for directors to resign their seats and offer themselves for re-election; but in the present instance it is not necessary. The Articles of Association (paragraph 58) provide that the directors shall remain in office until the second general meeting of shareholders In conclusion, the directors congratulate their fellow-shareholders on their successful formation of this company, and more particularly on account of the important ore discoveries already made, which cannot but be considered highly satisfactory.

[For remainder of Meetings see to-day's Journal.]

TASMANIAN TIN.

A report of the tin mines has just been made by Mr. Newman, mining engineer. He speaks of four companies—the Mount Bischoff, the Cummings and Henry, the Stanhope, and the Waratah. The last is named after the river flowing from the Mount, which rises 3000 feet above the sea. The Mount Bischoff has 160 acres, or two mineral sections, embracing the summit of the southern slope. The tailings will have a descent of 200 feet by the Falls of the Waratah. The Stanhope Company expects great things, as the show of wash dirt is so very promising. The section is on the east side of the hill, having a curious white-looking porphyry detritus. Further south there is the Menzies section, where the west bank of the river discloses 200 ft. of surface, with wash-dirt from 20 to 65 feet, producing 1 to 6 lbs. of stream tin to the dish. Some nuggets average not less than 70 per cent. We hear of masses of rock 60 per cent. "cropping several feet above surface." The density of the scrub is an obstacle to the investigation of the country. Already 35 mineral sections of 80 acres each have been taken up, on leases of 21 years, with liberty of extension 14 years more. The rental to Government is 5*s.* per acre a-year. This is double the charge made for leases of coal land. The amount is limited to 80 acres; while in the case of coal the lease may include from 40 to 320 acres.

The Van Diemen's Land Company is now coming to the rescue of the tin miners. Though the latter are close to the sea, the only accessible port is at Emu Bay, 50 miles north. As 35 miles of this distance belong to the company, it is intended at once to construct a tramway through the scrubby basaltic country within the borders of the London shareholders' property. These secured a grant of 350,000 acres in Van Diemen's Land just 50 years ago. Some good dividends may be expected through this lucky opening up of their back country in consequence of the Bischoff discovery. Conversing with the Victorian representative of the Stanhope Company, I gained a few other particulars. It appears that the original lessee of that mineral section, after an expenditure of 11,000*l.*, sold to Mr. Mounter for 24,000*l.* A company is now organised for work, and the prospects are quite satisfactory. From ½ acre of the 80 acres, 468 tons have already been obtained; while in Cornwall men are satisfied with 4 lbs. to the ton, the result of a trial with 18 tons at Launceston, in Tasmania, proved a percentage of from 51 to 73. The stone already on the ground will pay 1*l.* on every share of the 10,000 shares—a splendid dividend. The manager reports his ability to raise soon 50 tons a week. The other week Mr. Bischoff turned out that amount, realising over 25 tons of pure tin. While the foreign demand in the London market rose 50 per cent. between 1873 and 1875, and while, as reported, but two only of the tin companies of Cornwall have lately worked at a profit, the Tasmanians are naturally jubilant over their high percentage ores.

Mr. Lempriere informs me that information has come to Melbourne about the search after the tin lode at Stanhope. Making a trench of 4 ft. width, and sinking a 9-ft. shaft between the slate and granite, the lode was reached. It is supposed to go through the entire section, and it yielded 18 lbs. to the dish. Agreeable-looking nuggets, of from 2 to 8 cwts. each, are among the finds of this wonderful region. A tramway carries the ore to the Waratah Creek for washing. The sluicing sheds are fed by a wooden flume, 6 ft. by 2 ft., and the water has a clear fall of 53 ft. Examing the sediment of the water hole lately, the tailings were dis-

covered to realise as much as ¼ lb. to 1½ lb. to the dish. The Van Diemen's Land Company has made the offer of an advance upon the ore on the ground, at only 8 per cent., to save the miners the great cost of conveying the ore along a dreadful road of 50 miles to the port. Advertisements call for a gang of 600 men to commence the tramway. At present as much as 20*l.* a ton has been paid for cartage. The Stanhope director is erecting two furnaces at the mine to save part of the carriage expense: 1000 tons of wood were bought at the small cost of 3s. 6d. per ton. The furnace can thus be fed cheaply in that country of thick timber and huge trees, mounting 300 ft. from the ground, with holes 50 ft. to 60 ft. round.—*Iron.*

FOREIGN MINING AND METALLURGY.

There has been little change in the French coal trade; the situation exhibits, indeed, some indecision, notwithstanding the severity of the weather. In the Pas-de-Calais coalowners are raising and selling coal tolerably freely, but they have not succeeded, notwithstanding all their efforts, in advancing the rates current for even the most favourite qualities of coal. In the basin of the Loire business has been still dull; a slight reduction is even noted in some industrial qualities. The current price of coal at Paris is 48s. per ton, delivered at the consumers' cellars; this quotation will, probably, be current for the remainder of the winter. The Epinac Collieries and Railway Company has been paying this month a dividend of 8*l.* per share for the financial year 1874-5.

There have been no transactions of any great importance upon the various continental copper markets. At Paris, Chilian in bars, delivered at Havre, has made 86*l.*; ditto ordinary descriptions, 84*l.*; ditto in ingots, 88*l.*; English tough cake, 88*l.*; and Corocoro minerals (pure standard), 85*l.* per ton. At Rotterdam, Drontheim has made 50 fls. to 52 fls.; and Russian crown, 51 fls. Tin has ruled quiet upon the Dutch markets. Advices from Rotterdam report a sale of 12,000 ingots of Banca, at an average of 50⅜ fls. This price has not, however, been since sustained, and the latest quotations for Banca were 50 fls. to 50¼ fls., and for Billiton 49½ fls. A sale of 10,000 piculs of Billiton is to take place at Batavia, Dec. 13. At Paris, Banca, delivered at Havre or Paris, has made 93*l.*; Straits, delivered at Havre or Paris, 88*l.*; and English, delivered at Harve or Rouen, 89*l.* per ton. Lead has been fairly maintained; upon some markets, indeed, a slightly upward tendency has prevailed in this metal. French lead, delivered at Paris, has made 22*l.* 12s.; Spanish ditto, delivered at Havre, 22*l.* 8s.; and English, delivered at Havre, 22*l.* 8s. per ton. Zinc has also ruled tolerably firm; rolled Vieille-Montagne has made 34*l.* per ton at Marseilles. Zinc from other sources has also brought 32*l.* per ton upon the same centre.

There has been no improvement in the Belgian iron trade. A contract for six locomotive boilers was keenly competed for by seven different firms, whose tenders ranged from 3478*l.* to 4368*l.* A lot of old Vignoles rails were taken from the Belgian State railways upon the same occasion at 3*l.* 12s. 6d. per ton. The imports of iron minerals into Belgium in October have been officially returned at 62,104 tons, while the exports of iron minerals from Belgium in the same month were 11,660 tons. The imports of pig into Belgium in October were 10,111 tons. The exports of rails from Belgium in October were 5031 tons, while those of plates were 2059 tons, those of forged iron 7461 tons, and those of nails 733 tons. The aggregate exports of iron and pig from Belgium in the first ten months of this year only amounted to 186,904 tons, or 44,645 tons less than in the corresponding period of 1874, and 4589 tons less than in the corresponding period of 1873. During October Belgium exported 3484 tons of her metallurgical products to the Low Countries, 2340 tons to England, 2325 tons to France, 2336 tons to Russia, and 2540 tons to Italy.

The death is announced of M. Schneider, of the great ironworks at Creusot. The decease of this distinguished industrial leaves a void in the French metallurgical and mechanical interest which it will be very difficult to make good. M. Schneider took the direction of Creusot with his brother in 1836; at his death in 1875 the annual production of the works had been carried to 90,000 tons of iron and more than 80,000 tons of steel, while 15,000 workmen are now employed at what has become a great iron town. As regards the current condition of the French iron trade, it must be said to be bad; working operations are carried on from day to day, but at unremunerative—or comparatively unremunerative—prices. A revival in affairs remote at present. The profits of the Terfay and Ames Mesnes Company amounted in 1874-5 to 4320*l.*; this sum is to be employed in new construction operations. The profits of the Ariége Metallurgical Company in 1874-5 amounted to 29,914*l.*; of this sum 9240*l.* is to be distributed in dividends among the shareholders. The profits of the Pont-l'Evêque to 25,149*l.*; a dividend of 2*l.* per share has been paid for the year, and the undivided balance has been carried to the reserve fund, which has been thus increased to 4240*l.*

Cold, wet weather has set in in Belgium, and has given a fresh impetus to the demand for coal for domestic purposes, which has been readily disposed of. One cannot say as much of industrial qualities of coal, which suffer from the precarious state of metallurgical industry. Prices remain as last quoted, and there does not appear to be any prospect of an advance for some time to come. Should frost continue, the conveyance of coal by canal will shortly become no longer practicable. The consequences of this may possibly be rather grave delays in the delivery of coal, the more so as deliveries of beetroot to sugar works are employing at present a large number of trucks. A little foresight on the part of railway managers will, however, mitigate, of course, the inconvenience anticipated. The coal miners of the basin of the Centre have submitted to a reduction of 15 per cent. in their wages as from Dec. 1. No strike is reported at present in other quarters against the downward movement in wages, but one is threatened at Saint-Barbe. An adjudication has taken place this month of contracts for the supply of coal and briquettes during the first half of 1876 to the Belgian naval service at Ostend; the coal was contracted for at about 14s. 9d. per ton. The imports of coal into Belgium in October have been officially returned at 61,695 tons, as compared with 60,662 tons in September. The exports of coal from Belgium in October have also been officially returned at 368,894 tons, as compared with 364,856 tons in September. The French Mineral Industry Society proposes to hold a congress at Douai in June, 1876. The Luxembourg Mines and Sarrebruck Forges Company will pay on Dec. 31 a dividend for 1874-5 at the rate of 20 per cent. per annum.

DEEP MINING.—An instance was lately brought to our notice which bears on the all-important question to Colorado mineowners—Will deep mining pay? A lode which yielded good ore from the surface suddenly "pinched" at a depth of 70 ft., and though the crevice showed no fault, it was barren of mineral. The owners, however, stimulated by the faith of one party, continued the work of development for two years, attaining a considerable depth, but still finding no ore to reward their endeavours. Only one a miner of 15 years' experience in Colorado, dared to urge the others to persist, and then only with infinite urging and persuasion did they consent to put more money into what seemed a worthless shaft. A few days ago, at a depth of 450 ft., a body of rich ore 7 ft. wide was broken into, showing every indication of being continuous: 380 ft. of "cap" had been pierced, but we imagine no one of the owners now begrudges a cent of their expenditure. No amount of talk about our veins being mere surface deposits can gainsay this record, and the advocates of deep mining may rest confident that their plans will be crowned with success in every district.—*Mining Review* (Colorado).

VENTILATION OF CLEVELAND IRON MINES.—The provision, now being made, of enlarged ventilating apparatus at several of the chief iron mines in Cleveland draws attention to the modes adopted in these. The ordinary furnace, the fan, such as Guibal's, and the ventilating machine are the three modes in use; and it is becoming yearly more apparent that the first is losing ground, and fans and machines—especially the latter—are taking its place. Still, in most of the largest mines in Cleveland ventilation is wholly effected by the furnaces, some of which are of large dimensions. At Huntcliffe Mines a column of air, equal to 23,813 ft. per minute, passes over one of the furnaces; at Brotton nearly three times the volume of air passes in the same time over the furnace; whilst at one time the Upleatham Mines were ventilated by five furnaces, supplying 170,130 cubic feet per minute, but machinery has been introduced to dispense with these. Several fans are in use—one of the largest, on Guibal's principle, being employed at Eston Mines, the dimensions of which are 37 ft. diameter and 12 ft. breadth, and which, when driven at the rate of 52 revolutions per minute, displaces 164,000 cubic feet of air in that time. The machines in use were first tried at the Lofthouse Mines, where one of Cooke's was erected in 1872, composed of two sheet-iron drums, about 8 ft. in diameter and 16 ft. in length, mounted eccentrically on shafts. For this invention claims have been set up that it more fully ventilates the mine with an expenditure of less than one-half the fuel. The first of these machines having demonstrated its superiority to the old furnaces, it has been replaced by one on the same principle, but on a much larger scale, and a second is now being laid down at Lofthouse mines; and the principle has also been adopted at other mines of the Messrs. Pease. It is becoming increasingly evident in Cleveland that larger outputs will be demanded from the mines after the present depression is past, and with an increasing output increased ventilation is necessary, so that more and more ventilation will be attempted by machines and fans, to the growing disuse of the old-fashioned furnace.—*Engineer.*

A PRIZE ESSAY.

IMPROVED TREATMENT OF ORES AND MINERALS RAISED IN CORNWALL AND DEVON.

By THOMAS HENRY ALLEN.

[The Royal Cornwall Polytechnic Society awarded to this paper the "*Mining Journal* Prize" of books at their last meeting.]

The principal and most abundant ores of Cornwall and Devon are those of tin, copper, lead, manganese, iron, and zinc; these, with the non-metallic minerals, quartz, fluor-spar, hornblende, &c., constitute the bulk of the minerals raised in the two counties; numerous other ores occur, some of which have been turned to account, but either from the small quantities raised, or the lack of readiness with which they sell in the market, mining in general has been but little benefited by them. Wolfram, bismuth, nickel, cobalt, &c., belong to this class. This paper will treat generally of mixtures of two or more minerals where one is destroyed to make the other saleable, or both thrown away for want of an easy and cheap method to make them marketable with commercial advantage. Tin and copper ores are intimately associated in several of the leading mines of the two counties, as at Botallack, South Crofty, Phœnix, East Pool, Dolcoath, &c. These minerals are crushed together, and are not separated by any of the preliminary dressing processes. I have known parcels of tinstuff ready for the calcining ovens to be worth 3*l.* per ton for tin ore, and 50s. per ton for copper ore, and I know of no tin mine in Cornwall or Devon where an effort is being made to send this copper into the market; it is very evident that thousands of tons (which means tens of thousands of pounds worth) of these valuable ores are thus annually wasted. Now, after calcining a certain portion of the copper it becomes soluble in water, but not sufficient to precipitate with profit in many cases. A few tons of the tailings containing copper ore are occasionally sampled, but the separation is not good, consequently the tin ore, when ready for the smelters, contains copper which considerably lowers the produce and lessens the price.

An experiment was tried at East Pool, some time since, by Dr. Oxland, on the tin ore ready for market, which contained copper; 1 ton of the ore was placed in a suitable vessel and saturated with sulphuric acid, which completely dissolved the copper ores present, but in the subsequent dressing the bulk was found to diminish one-half, owing, probably, to the oily nature of the vitriol carrying away in suspension the fine tin ore in the process of buddling: 10 cwts. were also treated with similar results, and although the tin ore was freed from all traces of copper, it was done at a disadvantage to the mine. That something can be done to separate these ores with profit to the mine is the firm belief of the writer. To get the copper in solution is the difficulty, to save it afterwards comparatively easy, and well known to most parties, especially mine agents. Doubtless the best and most simple process for our mines is precipitation by iron, large quantities of that material (in the shape of scrap iron) being continually produced in our mines. Several processes are in use for the treatment of low-class ores—the "Sonora," for treating sulphuret ores, in use in Mexico; the "lime process," claiming great advantages, sulphuretted hydrogen being used as the precipitating agent; "Dr. Emmens's process," where fluor-spar is used in the roasting process, a solution of salt in the lixiviating process, and iron pyrites in the precipitating process; the "tank buddle and ammonia process," the invention of Dr. Thomas Clarke and Mr. G. Smith, in use at the Anderton Mine, near Tavistock. These processes claim to treat, profitably, stuff containing 1½ and even 1 per cent. of copper ore, and yet thousands of tons containing from 10 to 15 per cent. of the ore are annually thrown away in our mines without extracting one particle of the copper. No new process is required; no expensive buildings needed; but simply to use some lixiviating agent, as salt or lime, in the calcining process. Ovens for the purpose are to be found in every tin mine in the two counties. The ore having become converted into a soluble salt, when treated with water is held in solution. Here I would remark that all waters leaving the burning-house dressing-floors, when the ores contain copper, should be allowed to flow over scrap iron, placed in suitable strips, with a pit at the end for receiving the precipitated copper which may flow over, or at any time be agitated from the iron. Mine managers desirous of adopting this plan should visit Devon Great Consols, where the best and most complete precipitation works in the two counties may be seen. The precipitates yielding as much as 80 and 90 per cent. of pure metal. With tin at 45*l.* per ton I feel assured the extraction of this copper, which could be done at more nominal cost, would prove a blessing to mining, and a great boon to the adventurers.

Wolfram and cassiterite (tin ore) are found associated at Drake Walls, Hemerdon Ball, South Crofty, Kitt Hill, East Pool, Poldice, Bottle Hill, &c., where they are looked upon as being very unfavourable to the interest of the mine. The usual mode of separation is by stamping, then buddling; but owing to the specific gravity of the wolfram being but slightly greater than that of the cassiterite, the results are unsatisfactory. After being crushed the grain of wolfram is found to be flat, whilst that of the cassiterite is round, in comparison, consequently the grain of cassiterite rolls over the flat grain of the wolfram, and is found in the tail part of the buddle. This part is always the best for tin ore at the ordinary size of stamping. In many of the tin mines of Cornwall and Devon fine stamping is carried on to a great extent at a serious loss to the mine, but in the case of wolfram and cassiterite the great failure is their not being stamped fine enough. The grain of wolfram being more brittle, more friable, than that of cassiterite, by crushing fine a considerable quantity of it passes off in the water with a red colour, similar to that of iron, and in the subsequent dressing a better separation takes place. As an instance of the practicability of fine crushing for these ores at South Crofty, stamping through a 36-hole grate they made 5*l.* per ton more of the tin ore than a neighbouring mine stamping through a 34-hole, with the same class of work. Common salt calcined with tinstuff containing wolfram, at Bottle Hill and Drake Walls, has been found effective in destroying the properties of the latter, but the product has not been turned to account.

Wolfram, in its raw state, does not command a ready sale in the market. East Pool disposes of small quantities to a German company, whose usage of the mineral is private; but in the form of tungstate of soda a ready sale awaits it. Dr. Oxland's process at East Pool is a decided success; here the tin ore is highly contaminated with wolfram, which is first calcined to rid it of any arsenic or sulphur present; 8 cwts. of the calcined stuff is then mixed with 1½ cwt. of alkali (soda ash), and again subjected to the action of fire for three hours (a slow fire has been found more efficient than a fierce one, as it gives the tin ore a brighter colour, completely freeing it from the wolfram, thereby making a better market price), after which it is placed in iron pans about 2 ft. 6 in. deep, having a false bottom made of hair, supported by iron bars, and raised about 4 in. from the true bottom; water is poured in at intervals until all the tungstate has been got in solution and drained through the false bottom. This liquid is now pumped up through a lead pipe into a large vat, which is kept boiling until all the water has been evaporated, leaving the white solid tungstate of soda—25 cwts. of alkali, at 9*l.* per ton, makes 30 cwts. of the tungstate at from 12*l.* to 18*l.* per ton, thus showing the process to be of great importance to the mine. Should the patent lately obtained by the Rev. Dr. Jones for preventing the ignition or inflammability of wood prove a success, it will greatly enhance the value of wolfram, as it is one of the principal ingredients used. The price of raw wolfram as selling on the mine is 8*l.* per ton.

Mispickel (white mundic), the principal source from which the arsenic of commerce is obtained, often occurs with tin ore, but more especially in the slate than in the granite districts. An old adage among the Cornish miners is—"Where there's white mundic there's tin." This saying, I believe, holds good in most cases. Owing to the small quantities of tin ore found with the mispickel in some mines, furnaces have been erected for calcining the ores previous to stamping. Specimens may be seen at Wheal Friendship, Boiling Well, South Roskear, &c. A single furnace consists of a square block of masonry raised to an height of 16 or 18 ft., leaving a round perpendicular kiln in the middle, with an aperture at the bottom for drawing the charge. After the furnace is once lit it will continue burning (self-supporting) for any length of time. To start, the kiln is filled to two-thirds its height with some non-inflammable substance of suitable size for giving the air a free passage. Some dry wood is placed on this and ignited, then a layer of coal, and when this is sufficiently kindled a charge of about 6 cwts. of arsenical mundic is thrown in, the fire takes hold of the inflammable properties of the mundic, and under favourable circumstances, after burning for four hours, a charge is drawn at the bottom, and another let in at the top. After the first charge has become thoroughly ignited each of the others become self-supporting in succession, yet there is room for improvement, as the ores thus roasted contain 10 per cent. of arsenic, being no longer capable of supporting combustion, consequently at the present moment stone arsenical mundic does not find a ready sale in the market. The question is whether the ores are too coarse to admit the heat necessary for expelling the arsenic from the interior; or too fine, choking the air-passage, thus causing the deterioration. Or whether it will pay to introduce coal fires, similar to the lime-burning process. Great attention should be paid to the mixing of the ores for roasting; they should not be too rich, for in that case they fuse to a mass, blocking up the kiln, and causing considerable difficulty and delay in clearing it; nor too poor, as 10 per cent. and below is incapable of self-supporting combustion. The arsenic deposited in the chambers and flues is found to be superior to that produced by burning the finely crushed ores. The residue, which is amorphous and very brittle, is afterwards crushed, and the tin ore extracted in the usual way. The ingenious brain will find great scope here for improvement. But when much tin ore is found with the mispickel it is first stamped, and the specific gravity of the two minerals varying but little, they are only separated when subjected to the action of fire in the calcining ovens. The "tin witts" should be made as pure as possible, so that the inflammable properties of the mundic might be utilised to assist its own combustion, thereby requiring less coal, and burning, as it were, two "servings" in one. In many cases parties seem to work under the "penny wise and pound foolish" system by sending one-half too much to the burning-house. Crude arsenic realises at present from 6*l.* to 8*l.* per ton.

[*To be concluded in the Supplement to next week's Journal.*]

TREATMENT OF AURIFEROUS ORES.

An interesting paper on "Saving Gold from Sulphurets" was read at a recent meeting of the Microscopical Society of San Francisco, by MR. MELVILLE ATTWOOD, in which he remarked that those who have been for the past 23 years in any way connected with the California gold mines will frequently have heard the complaints of miners and millmen that the gold of such and such a mine or claim was rusty, rebellious, coated with some substance that prevented it from amalgamating; that it floated on the surface of the mercury, and that they had tried all the different processes in use in the district, and that they could not by those methods save the gold. In speaking of their mines they said the rock contained so much free gold, besides that in the sulphurets, thereby inferring that the gold in pyritic matter was mineralised. He has good reason to know that in two many cases the fault arose not from the imperfect mode of treatment, but that the rock really contained little or no gold to save. Now, the fact is that the gold occurs mineralised only by tellurium, that there is no ore of gold except the telluride of gold and silver, which is found in such limited quantities as to be hardly deserving of notice, so that with that unimportant exception all the gold met with in the different mines of California exists as a metal, and in that form is only mechanically combined with other minerals existing in exceedingly minute particles, with the arsenical and iron pyrites, sulphide of zinc, &c., in consequence of which all these required to be stamped or reduced to a very fine state to liberate it. Mr. Attwood sought, by the aid of the microscope, to prove this mechanical combination, which is still regarded by many as an open question.

For the last 40 years Mr. Attwood has been more or less practically engaged in mining and milling for gold, and during that time has seen processes too numerous to mention tried to save gold, from the most primitive down to what is used at the present time; also, the plan of roasting the vein matter, and the chlorination process for the sulphurets or pyritic matter, and can now fully realise what time and money might have been saved had a microscopic examination been made of the vein matter under treatment by the different processes. In answer to the complaint of the miners and millmen Mr. Attwood remarks that a microscopic inspection would have revealed to them that there was no such thing as rusty gold, and that the float was only laminated gold, caused by the action of the stamps, or from other causes, and in that state exposing a great amount of surface in proportion to its weight, and that the pyritic matter had only to be reduced or stamped to an exceedingly fine state to free the gold encased in it, which would then amalgamate with the same facility as the rest of the gold in the quartz. If an examination had been made of the roasted veinstone it would have been found that a large portion of the gold by that process was in a manner enveloped in a slag, and thereby partially rendered unfit for amalgamation—he referred to roasting in heaps.

The mounted specimens which Mr. Attwood exhibited in illustration of his lecture included specimens showing gold mechanically combined with prismatic iron pyrites, with arsenical pyrities and zinc-blende, and with telluride of gold and silver, jacotinga, in talc, and in rock roasted in heaps, kern with zinc-blende and arsenical pyrites, minute particles, float gold, beach gold, and placer gold. For a number of years at the St. John del Rey Mine, Brazil, they have obtained all their gold from the concentrated pyritic matter—sulphurets—by simple amalgamation in barrels. The concentrated stuff or sulphurets, which is a mixture of arsenical, common and magnetic iron pyrities is also termed in California rebellious ore. Mr. Dietzsch in his report to the company in 1867 says:—"Our actual process of amalgamating the sand is under ordinary circumstances sufficiently complete: 50 lbs. of ordinary mercury combine with 36 to 40 ozs. of gold dust disseminated in 16 cubic feet of pyritic sand (sulphurets) free from decomposition, in the rotating barrels during the 24 to 26 hours, leaving in the residue little more than ½ oz. of the gold contents, part of which, being still in mechanical combination with the sand, is afterwards extracted by a further grinding in the arrastras." By Mr. Dietzsch's report it appears that the actual loss of gold in the amalgamation of their sulphurets in barrels does not amount to 1 per cent. In the same report it states that the stamps in that year reduced 60,635 tons of veinstone, and the quantity of sulphurets amalgamated was about 3891 tons. The loss of mercury 1461 lbs., or at the rate of little more than 6 ozs. to the ton of sulphurets. The cost per ton of the veinstone treated was 4s. 6½d. The St. John del Rey veinstone, when it is called pure, may be taken at 43 per cent. of silica, and 57 per cent. of pyritous matter. Of these minerals arsenical pyrites is usually the most auriferous. Gold is rarely seen previous to concentration in any of the veinstone from this mine.

By the Washoe pan process the waste of mercury in the working of the Comstock silver ore and argentiferous gold amounts to nearly three times that of the St. John del Rey, notwithstanding that the mineralised silver treated in the pan mills scarcely ever reaches to more than 2 per cent. It may not be known to many, yet it is nevertheless a fact, that the milling of any of the rich gold veinstone of California, excepting those holding the tellurides, even it contain 80 per cent. of pyritic matter, may be accomplished with a loss of under 4 per cent. of the gold contents of the veinstone, by the simple process of dry stamping and amalgamation in barrels, and with a loss of under 15 per cent. by the Washoe process of wet stamping and amalgamation of the pulp in pans—without chemicals even when the gold contents of the veinstone is under $10 per ton. Low-grade veinstone will not, however, bear the expense of dry stamping and barrel amalgamation, or even the Washoe process. Mr. Attwood believes that when fairly tested the use of chemicals in the treatment of a large portion of the Washoe silver ores will be found to be as great a mistake as that of allowing (as they now do in some of the large new mills) the pan to do the work of the stamps. In other words, that the Washoe mills would get through more ore and obtain larger results by finer stamping and using little or no chemicals in their milling operations. The loss in working-grade gold rock in Australia, from the published reports of the different mining companies, averages about 20 per cent. on $8 or $10 rock. What is done at the California gold mines he is unable to say, as in their reports they do not give either the gold contents or loss on treatment. In Australia they appear to work to a profit a lower grade of rock than is done in California.

Replying to the paper of Mr. Attwood, some interesting particulars have been given by Mr. C. H. AARON (and published in the "Mining and Scientific Press of San Francisco"), who states that on several occasions he has examined pyrites which, however finely pulverised, failed to show gold with the aid of a good lens, yet on being burned or treated with acid it was abundantly visible without the lens. As to the Comstock ore he is not prepared to dispute Mr. Attwood's statement that only 2 per cent. of the contained silver is in a mineralised state, but he takes the liberty to doubt it, but it is well-known that the parties engaged in working those ores have been in the habit of guaranteeing only 65 per cent. of the assay, and the best results he has ever heard claimed for the common pan process did not exceed 75 per cent. of the value, a considerable portion of which was gold, which probably exists entirely in the metallic state in these ores; while he has been repeatedly assured, by those who ought to know, that not more than 50 per cent. of the silver is extracted on an average. Now, this ore is all ground fine, and according to Mr. Attwood's views it would seem that a better result should have been attained; for though he considers it an error to grind in the pans, instead of crushing finer in the batteries, Mr. Aaron presumes he does not attribute the failure to amalgamate to that circumstance. Neither can this failure be ascribed to the use of chemicals, for it is well known that chemicals in pans have been discarded altogether by some operators; not, however, because of any positive detrimental effect, but because of the doubt as to a beneficial effect; and the question is, Mr. Aaron believes, still an

open one as regards the use of bluestone and salts in pans of rapid motion, the simple fact being that the full effect of these substances cannot possibly be got under such conditions, for the reason that, if added at the time of charging the pans, the ore is in too coarse a state to be rapidly acted on by the chloride of copper; whilst if the ore is ground in the pan, either before or after the addition of these, or any useful agent, the finely-divided iron which is separated by abrasion from the shoes and dies, and distributed through the pulp, soon decomposes the salts of copper, or combines with acids, and results simply in chloride of iron, which is of little if any use. Any benefit which is obtained from the use of bluestone under such conditions must be due rather to the action of reduced copper than to the action of copper chlorides on the ore.

Granting, then, that the chemicals, as used in the pan process, produce but little effect either way, the fact remains, in Mr. Aaron's opinion, that fine grinding and amalgamation fail to give satisfactory results; and he asks—Does Mr. Attwood suppose that it would make a material difference if the ore, instead of being rather coarsely crushed and then ground fine in the pans, were to be finely crushed and amalgamated without grinding (and without chemicals) in barrels? Even if the case were as Mr. Attwood supposes, it would still be very doubtful if any advantage could be thus gained, as it can be shown that results which leave little or nothing to be desired can be got by the use of chemicals, properly applied, without such very fine crushing as would be necessary without chemicals, and at less cost. In the Patchen process the chemicals are applied to the ore as it comes from the battery crushed, perhaps, a little finer than is usual, but not extremely fine, in a wooden or copper vessel, before the amalgamation in pans, and the results are stated to be over 90 per cent. In 1868 Mr. Aaron treated in a small way Comstock ores, just as they came from the stamps, by amalgamation, with the aid of chemicals of the value of 50 cents to the ton, exclusive of salt, and obtained 90 per cent. of the silver and 80 per cent. of the gold, the value ranging from $22 per ton up to hundreds. If the chemicals are used directly in the pans, it is much better to use the di-chloride of copper than bluestone and salt, as is fully shown by Dr. Lanzweert, who in 1865 stated that he worked several hundreds of tons of ore with good results, but does not inform us whether the ore was ground, if at all in the pans, before or after the action of the reagent. Mr. Aaron agrees with Mr. Attwood that the Comstock ores should be crushed finer in the batteries; not, however, for the purpose for dispensing with chemical treatment, but in order that it may be applied with more advantage, as the quantity of iron ground off the battery is much less than that from pans, and could be so reduced by using steel shoes and dies that the quantity of copper precipitated would, with proper management, be re-dissolved by reduction of silver chloride produced by the chemicals.

A CHAPTER ON MINING—SURRENDER MINE, REETH HIGH MOOR.

The art of mining and the art of war are near akin. In war, the greatest general is he who makes the fewest mistakes; in mining the same rule obtains. If the history of every mine in England were faithfully written the failures would far outnumber the successes; and if mining people would only study the causes of the failures and try to avoid them, future successes would be more numerous. It is proposed in this paper to exemplify how a prosperous mine may be stopped in its career by the ignorance of agents on the one hand, and the credulity of their employers on the other. About 50 years since the late Dr. Robinson, of Richmond, was a medical practitioner at Reeth, and had not been long there before he discovered that the chronic epidemic of the district, mental and physical, was "Mining." Naturally enough, therefore, he took up the study of the prevailing disease, and, being a shrewd man, soon discovered that mining was likely to pay better than physic, if seasoned with judgement, and hence became an investor. By degrees he became a principal partner in the Arkendale, the Old Gang, the Surrender, and other mines, and died affluent and respected at a good old age. The doctor was a lessee of Surrender about 50 years since. The mine during the previous occupation of Messrs. Chaytor and Co. had been a prosperous one, and continued so for a considerable period under the doctor; but at length all the best ore went down under their feet in water, and they were drowned out. The doctor was, however, also a shareholder in the Arkendale Mines, and adjoining the Surrender ground was a certain level called Mould's Level, which being many fathoms below the bottom of any shaft or level on the Surrender ground, would if driven up to and beyond the boundary eventually drain the whole, and become the key of the position.

After a lengthy negociation this wayleave was obtained from Mr. Gilpin, the then lessor of the Arkendale Mines, the lessees of the Surrender Mine agreeing to pay for driving up Mould's Level to the Surrender boundary, and a further sum of 2000*l.* in cash, with liberty to dress their ores and team their deads at Mould's Level mouth. The effect of this agreement was to make Mould's Level the central station from which all the veins on both sides were to be worked, and the only mistake the doctor made was not stipulating for a permanent wayleave instead of one only for 21 years. From the date of this agreement the work was vigorously carried on, and Mould's Level was continued right through the Surrender ground for upwards of a mile, the Arkendale veins being unwatered and worked from the Surrender side, and the Surrender veins from the Arkendale side, to the mutual advantage of both royalties. At the end of 21 years the Arkendale lessor demanded a further claim of 100*l.* per annum for the continuance of the wayleave, at which the doctor, who was still the lessee of the Surrender, naturally demurred; but, after much correspondence, finally agreed to pay 20*l.* per annum, and continued to do so until from increasing years, and the mine getting poor, he gave it up, and the then and present proprietor (Sir G. W. Denys, Bart.) took it into his own hands, never for one moment dreaming that a privilege which had been granted for about 35 years would ever be withdrawn. For about five years the wayleave was kindly granted to the present proprietor—Mr. Gilpin Brown—without any payment being demanded. As soon, however, as the new Arkendale Company was started, under the management of Wm. Whitwell, and under the auspices of Mr. Blenkiron, agent to Mr. Gilpin Brown, it was suddenly discovered that the aforesaid wayleave caused great injury to the Arkendale Mines, and that the wayleave could not be continued for love or money. It was accordingly withdrawn. Conceive for a moment the effect that would have ensued had all the metropolitan railways been made so as to converge to one central station, and that after 35 years or more an Act of Parliament had been passed suddenly ordering the traffic to be reversed to four suburban stations, and the inevitable confusion and loss that would have been entailed. Yet this is what actually took place at Surrender, the mine was practically shut up; a mine that during 40 years had raised upwards of 250,000*l.* worth of lead.

The suicidal folly of this act was patent to every miner about the place. In shutting their neighbours out of Mould's Level they excluded themselves from Surrender Level, which is the key to Danby and Damrig veins in the lower beds. From Wide Turn Rail in the Surrender ground those veins had been unwatered, and got thousands of bings, but they cannot be touched from the Arkendale side until the long and expensive level from the Arkendale Mill is driven up to their intersection. The driving of this level is, at least, of doubtful expediency; the Arkendale Company might, by first sinking in the veins which they had by the end, have proved whether there was a prospect of ore down below to warrant such an expenditure of time and money. But neither Mr. Gilpin Brown nor his Stockton solicitor are practical miners. Thus Mr. Whitwell, who was new to the district, Mr. Blenkiron, a young man without much experience, and Matthew Woodward, an excellent woodman, but neither a miner nor qualified to be an agent, became masters of the situation.

The reason alleged by Messrs. Whitwell and Blenkiron for the refusal of this wayleave was "that the water running out of Mould's Level might partly percolate through the beds underneath that level and fill them with water." A more unminer-like notion cannot be conceived. Levels driven into a hill sides are like holes bored into a cask of water, the more holes the less water will the hill and cask contain. So convinced was Mr. Blenkiron of the truth of his assertion that he actually proposed to dam the water back into Surrender by hermetically closing the communication. Now, setting aside the absolute illegality of such an attempt, if made, Mr. Blenkiron, if he had any mining experience, must surely have known that by so doing he would only have aggravated the evil, for the veins on both sides of the boundary having been worked underneath Mould's Level, the water instead of running out as at present would run underneath into the old workings and swallow holes. These statements are not made out of spite or ill will against anyone of the parties named; they are simply written in order to show how frequently neighbouring mines are mutually dependent upon each other, and that in order to be profitably and economically worked, a kindly feeling not only between neighbouring proprietors, but also between the managers and agents on both sides, and between masters and men should be continually cultivated. It is almost invariably found that wherever there has been discord and mischief it has arisen through the jealousy and quarrelling of the agents, and unless the proprietors will take the pains themselves to sift the matter thoroughly great harm and loss may more than probably, ensue. The Surrender ground has along been chiefly worked by Arkendale men, and they have gone backwards and forwards for upwards of 50 years as it suited them. When Arkendale was poor they flew to Surrender, and when Surrender was not flourishing they went to Arkendale; by this means the mining population was kept together, and Mr. Brown's rents were paid; but now it appears that, under present management, if a man leaves the Arkendale Mines and applies for work at Surrender he is threatened with ejection from his house and land. An instance of this was alluded to in the *Richmond Chronicle* of Oct. 23. Six of the men alluded to have left Surrender and have returned to work in Arkendale.

It is well to remember the old adage "That any man can take a horse to the pond, but no man can make him drink unless he likes." You may force a miner to go into a spot against his will, but you cannot make him work, no matter what the price is. A man's labour is his capital, and he has a right to employ it wherever he thinks proper. It is good policy upon the part of mining proprietors to let the miners have their bits of land and houses at an easy rent; it makes them stick to their homes and to their work, and they work for less wages; but it is bad policy to tie their hands and tell them they shall not work upon any ground but their own. Such a policy is simply suicidal, and creates bad feeling. The Surrender Mine has been worked for the last two years and three months by a limited company. The question of the productiveness of the lower limestone beds would have been settled ere now if they had retained the old approach by Mould's Level; but as it is it will take them a long time and require a heavy outlay, both of which might have been saved. The benefit of such a trial in the very centre of the best plot of ground in Swaledale would have been shared by the Arkendale and the Old Gang, as well as by the Surrender Company, but the chance has been lost, and it is of little matter whether it has been through ignorance, jealousy, or bad feeling, or all these combined. The evil that men do lives after them; but time brings about its revenges also, and Arkendale may one day want the privilege that has been denied to Surrender. More than 20 years ago the late Dr. Robinson saw that Mould's Level should be continued through Surrender, and from its junction with Grey Game vein to the boundary of the north-west corner of the Surrender ground, and through the corner of Old Gang, and thence in the said Grey Game vein right through the Arkendale liberty to Punchard Gill. He proposed that each company should pay the cost of driving through their own ground, and the right of way be common to all. That was the idea of a real practical miner. Sir Francis Level is a joint trial of the same sort, and if neighbouring proprietors and companies studied their own interests and looked further ahead many more such trials might be made, to the mutual benefit of all concerned. We have thus endeavoured to show how the career of a prosperous old mine may be stopped for an indefinite period through a want or mining knowledge and experience, and, in conclusion, express our hope that under their present management the A D Company (Limited) will see long revive the renown of the Old Surrender Mine. The prosperity of the district being mainly dependent upon the successful working of the lead mines, we close these remarks with a further hope that they may tend to the avoidance of similar mistakes in the future.

THE GEOLOGY OF CROYDON.

To a very large proportion of the general public science is only attractive when made essentially popular, and it has long been acknowledged that the readiest means of popularising a science is to connect it with something with which those who are to be instructed are intimately acquainted. To adopt this course with regard to the science of geology is extremely difficult, since it demands from the teacher not only a complete knowledge of the localities familiar to his pupils, but a power to demonstrate the connection which they have with the geology of other parts of the world. In the lecture recently delivered before the Croydon Microscopical Club by Prof. JOHN MORRIS, F.G.S., on the "Geology of Croydon in relation to the Geology of the London Basin and other Localities," the information is precisely of that character likely to prove of pecuniary value to those hearing it, and at the same time calculated to create a desire to study the science more deeply; he showed that geological knowledge can be utilised, and that considerable interest can be made to attach to the acquisition of that knowledge. Being at Croydon, and dealing with the geology of the locality, his audience obtained almost before they were aware of it a large amount of instruction through his constant reference to what they must have constantly observed in their walks and drives around their own homes, until at last they discovered that they had long taken interest in geology, just as Molière's bourgeois gentilhomme discovered that "prose" was what he had been talking all his life.

In a very brief period Prof. Morris gave an outline of geology, which proved ample to make his hearers comprehend and appreciate the particular branch of the science of which he proposed to treat; and, as the rocks around Croydon are all of aqueous formation, consisting of gravel, sand, clay, and chalk, which are either of marine or estuarine origin, he had but little difficulty in enabling his audience to follow his vivid descriptions. The Purley beds, the upper and the lower Kenley beds, and the upper and the lower Marden Park beds, were in turn referred to, and these must have been as familiar to the denizens of Croydon and the neighbourhood as the beds in the Temple Gardens are to the inhabitants of Fleet-street. For the Oldhaven sand and pebble beds Prof. Morris referred them to the exposures at Park Hill, Duppas Hill, and Croham hurst; to the picturesque district of Shirley Common and the Addington Hills; or, further east, to Blackheath and Bexley Heath. He directed them to Beddington for the lowermost tertiaries. He pointed out where they might look for crocodiles and turtles near their own home; and, although the latter might not be in a condition to contribute to the luxuries of a municipal feast, the aldermanic love for turtle may be accounted for, as the Professor suggested, by supposing that the spirit of the old Sheppy chelonian has not been lost in the London area. The lecture, which has been published by Mr. F. Baldiston, of Croydon, was admirably illustrated by a beautifully coloured geological map of the district, and by various carefully arranged tables; and, as these are all reproduced in the pamphlet, an opportunity is afforded for more carefully studying the subject at their leisure, not only to the members of the club, but to any of the inhabitants of the district desirous of availing themselves of it. Corresponding lectures for the various suburban districts would, doubtless, prove highly enjoyable to the members of the various local institutes and clubs during the winter evenings, and it may be hoped that in each locality it may replace one of the light and frivolous entertainments which are too often the only source of amusement within reach.

BRITISH MANUFACTURING INDUSTRIES.

There are so many who now take an interest in technical matters, although not directly connected with the branch of industry to which they relate, that the series of popular manuals such as those Mr. G. P. Bevan has undertaken to edit* will certainly be appreciated by a large class of readers. It is stated that the object of the series is to bring into one focus the leading features and present position of the most important industries of the kingdom, so as to enable the general reader to comprehend the enormous development that has taken place within the last 20 or 30 years. Hitherto the only means of acquiring knowledge as to the progress being made has been to consult handbooks to the various manufactures (which are usually too minute in detail for general instruction), trade journals, and the reports of scientific societies. To obtain and systematise these scattered details is a labour and a tax upon time and patience which comparatively few persons care to surmount. In Mr. Bevan's series the facts are collected and presented in as readable a form as is compatible with accuracy and freedom from superficiality. The character of the information to be expected may be judged of from the fact that in the list of contributors there are found the names of such men as Mr. J. Arthur Phillips, Profs. Warington Smyth, Hull, Church, and Archer, and Messrs. P. Le Neve Foster, Samuel Davenport, C. Haughton Gill, Dr. Rumbault, and others of scarcely less celebrity.

In the chapter on iron, the various changes which take place in the different zones of the blast-furnace are well explained, and there is a fair account of the puddling process. The Henderson fluor-spar process of removing sulphur and phosphorus is very highly spoken of. In the chapter of steel the cementation and Bessemer processes are described, and there are some statistics to show the progress of the iron trade. Copper is treated of in a very different manner by Mr. J. A. Phillips. He gives analyses of some of the brasses made between B.C. 20 and A.D. 165, as well as of some more ancient copper alloys, describes the chief ores of copper, then explains the method of assaying copper ores, and lastly gives an account of the copper smelting process. The whole of this information is compressed into 45 pages, and is very readable. The remaining 60 pages are occupied by chapters from the pen of Mr. Walter Graham on brass founding, tin, tin-plates, tin alloys, and zinc working respectively. Mr. Graham thinks the word tin is derived from the Saxon *tan*, but others will probably entertain a different opinion, and in the succeeding chapter he explains that the commercial blocks or ingots of zinc are known as spelter from the German *spianter*, and that by the middle of the 18th century it was understood that the *tutenag* of the Indians, and the "spianter and zink" of the Germans were one and the same article. He shows that in 1823 England imported 5400 tons, and exported 4700 tons, whilst in 1872 she imported 27,291 tons, and exported but 5081 tons. Referring to the application of zinc to collateral arts, Mr. Graham mentions that an interesting use has been made of zinc by the farmer who makes his cream in zinc vessels, which is said to result in a net increase of 12 per cent. more cream than if made in vessels of any other substance.

The volume is worthy of commendation as a thoroughly popular handbook of the subjects treated of, and one which would be read by many to whom an ordinary technical treatise would be distasteful. If the quantity of information be not large, and, considering the very brief nature of the book, more cannot be reasonably expected, the reader may congratulate himself that most of the statements are reliable, and not without utility. The printing, paper, and binding are so excellent that the series will be well worthy of a place in the library.

HANDBOOK FOR CHARCOAL BURNERS.

Although charcoal burning is practised to an exceedingly limited extent in the United Kingdom, the account of the process as practised in Sweden will be interesting to a large number of readers; it is, therefore, gratifying to find that an English translation of Mr. Svedelius's book† has been made. It appears that the Government of Sweden offered in September, 1862, a prize of 1500 rixdollars for the writing of a suitable and popular treatise on the manufacture of charcoal and the preparation of peat. A committee of three, representing the commercial, agricultural, and iron manufacturing interests of the country, was appointed to decide on the papers handed in. The first four treatises sent in were deemed unworthy of the prize. In June, 1867, seven treatises had been handed in. Of these the committee decided that no one deserved the prize, but concluded to give to the authors of the best two productions 850 rixdollars, upon condition that they gave their productions to the committee to use as it deemed proper. The committee then recommended that these two treatises be given to a third party, and a prize of 650 rixdollars be offered him for a satisfactory paper on charcoal making only. Mr. Svedelius was designated; he accepted the appointment, and produced the work now translated, which was duly approved, and published by the Government.

Ever since the earth began to produce plants and animals there has been, says the author, a constant chemical separation and transposition of the elements—carbon, oxygen, hydrogen, and nitrogen, which united in various ways make up the organic composition taking place; then, by the assistance of the air, all the organic substances assume the gaseous form, and only the inorganic substances remain, in the form of ashes, burnt bones, &c. These inorganic substances are everywhere found in greater or less quantities. If, on the other hand, the change takes place slowly, while the free admittance of the air is more or less limited, then only a part of the organic elements escape in the form of gas, and a number of solid and liquid substances are formed, which remain, as it were, on the boundary line between organic and inorganic bodies. A well-known substance of this kind is the soil, with its innumerable varieties. Other similar substances, although differing much in composition and quality, are coal, charcoal, and peat, which are subject to the same process of decomposition. This decomposition strives to release in the form of gas all oxygen, hydrogen, and nitrogen, with a greater or smaller portion of carbon, while the remainder of the carbon and most of the inorganic elements remain unaffected by the chemical action referred to. Besides the slow process of making coal, which, he continues, takes place everywhere in Nature's laboratory where remains of animal or vegetable life are found, either in large masses or in scarcely visible quantities embedded in the earth, man has from time immemorial used artificial methods by which in a few days changes are produced in wood, coal, and other materials as great as those which nature takes thousands of years to produce. It is worthy of notice that all the various gradations of coal-bearing substances, from graphite, through anthracite, bituminous coal, and charcoal, to the nearly unchanged wood and peat, which we find in the bowels of the earth, have their counterparts in the charcoal pit, from the black glistening ringing coal, through the sooty variety of coal without lustre, of a brownish colour, and burning with a flame to the brownish-white brands; and the tar produced in the charcoal pit has its counterparts in the petroleum and asphalt of the earth.

After treating of the elementary composition of wood, its moisture, seasoning, shrinkage, &c., and the general qualities, composition, and properties of charcoal, Mr. Svedelius describes the process of making charcoal in much detail, treating respectively of standing meilers or heaps on horizontal hearths with chimney and covering; the several periods of coaling: the German and Italian standing meilers; the coaling of slabs and other refuse from sawing; the coaling of stumps, roots, and branches; standing meilers on a horizontal hearth, with a centre bleek; standing meilers on sloping hearths; and lying meilers. The fourth chapter describes the result of coaling. By way of appendix nearly 50 pages of valuable notes are given, and will be found exceedingly useful in elucidating the matter contained in the body of the work.

* "British Manufacturing Industries." Edited by G. PHILLIPS BEVAN, F.G.S. Vol. I., containing Iron and Steel, by W. M. Williams; Copper Smelting, by J. Arthur Phillips; and Brass Founding, Tin-Plate, and Zinc Working, by Walter Graham.

† Handbook for Charcoal Burners. By G. SVEDELIUS. Translated by R. B. ANDERSON, A.M., Professor of Scandinavian in the University of Wisconsin, and edited, with Notes, by W. J. L. NICODEMUS, A.M., C.E., Professor of Civil Engineering, same University. New York: John Wiley and Son. London: Trübner and Co., Ludgate Hill.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coal into and from the port and district of London, by sea, railway, and canal, during November, 1875:—

IMPORTS.

By sea.	Ships.	Tons.	By Railway and Canal.	Tons	c.
Newcastle	225	173,943	London & North-Western	107,257	3
Seaham	9	3,456	Great Northern	120,192	0
Sunderland	113	75,108	Great Western	49,491	0
Middlesborough	3	1,326	Midland	154,423	0
Hartlepool	94	31,146	Great Eastern	51,320	9
Scotch	21	5,963	South-Western	6,751	17
Welsh	6	2,077	London, Chatham, & Dover	1,635	0
Yorkshire	32	8,431	South-Eastern	1,353	7
Smallcoal & cinders	12	3,776	Grand Junction Canal	306	5
Total	515	304,026	Total	492,730	1
Imports—Nov., 1874	484	262,220	Imports—Nov., 1874	415,605	4

Comparative Statement, 1874 *and* 1875.

By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.
Jan. 1 to Nov. 30, 1875	5080	2,844,646	Jan. 1 to Nov. 30, 1875	4,550,085
Jan. 1 to Nov. 30, 1874	4737	2,436,766	Jan. 1 to Nov. 30, 1874	4,250,802
Increase—present year	343	407,880	Increase in the present year		299,283

EXPORTS.

Railway-borne coal passing "in transitu" through district...Tons		85,589
Sea-borne coal exported to British possessions, or to foreign parts, or to the coast	49,402	
Ditto, sent beyond limits by railway	11,223	
Ditto, by canal and inland navigation	2,096 =	62,721
Railway-borne coal exported to British possessions, or to foreign parts, or the coast	27,028	
Ditto, by rail beyond district		
Ditto, by canal and inland navigation	172 =	27,200
Sea-borne coal brought into port and exported in same ships		1,864
Total quantity of coal conveyed beyond limits of coal duty district during November, 1875		177,373
Ditto, November, 1874		189,981

Comparative Statement, 1874 and 1875.

Total distribution of coal from Jan. 1 to Nov. 30, 1875	1,643,676
Total distribution of coal from Jan. 1 to Nov. 30, 1874	1,580,508
Increase in the present year	63,168

General Statement, 1874 *and* 1875.

Increase in coals imported by sea during the present year	407,880	
Increase in ditto by railway	299,283 =	707,163
Deduct increase in coals exported		63,168
Total increase in trade within London district during present year		643,995

CHEMICALS, MINERALS, AND METALS—(Messrs. J. Berger Spence and Co.)—Soda: Cream caustic, 60 per cent., 12*l.* 5*s.*; white, 60 per cent., 12*l.* 15*s.*; soda ash, 1¾*d.* to 1 15-16th; soda crystals, 5*l.*; bi-carbonate, 11*l.* 15*s.*; salt cake, 2*l.* 17*s.* 6*d.*; Glauber salts, 3*l.* 5*s.*—Bleaching Powder: At 7*l.* 2*s.* 6*d.*; for the whole of 1876, 7*l.* 15*s.*—Alum: 7*l.* 10*s.* for loose lump; ground, 8*l.* 5*s.*—Aluminous cake, 5*l.* 15*s.*—Nitrate of Soda: 11*s.* 6*d.* to 11*s.* 9*d.*—Ammonia: Sulphate, grey, 18*l.*; white, 18*l.* 15*s.*; carbonate, 5*d.*; muriate, 30*l.*; sal ammoniac, firsts, 45*s.*; seconds, 44*s.*—Potash: Muriates, 80 per cent., at 6*l.* 5*s.* to 6*l.* 7*s.* 6*d.* f.o.b.; Prussiate, red, 2*s.* 3*d.*; yellow, 12½*d.*; chlorate, 9*d.*; bichrome, 5¼*d.*—Iron Salts: Green and rusty copperas, 35*s.* loose; in casks or barrels, 60*s.*—Copper Salts: Sulphate of copper, 25*l.* 10*s.*—Litharge: Best flake, 24*l.* 10*s.*—Sugar of Lead: Brown, at 26*l.* 10*s.*; white, 40*l.* 10*s.*—Acid: Tartaric, English, at 1*s.* 6*d.*; foreign, 1*s.* 5½*d.*; oxalic, 5*d.*; sulphuric, 3*l.* 10*s.* to 3*l.* 15*s.*; carbolic, No. 1, 10*d.*; picric acid, 1*s.* 10*d.* per lb.—Arsenic: 13*l.* 15*s.*—Magnesia: Epsom salts, 3*l.* 17*s.* 6*d.*; refined, 4*l.* 10*s.*—Esparto: Oran, fair to best, 7*l.* 10*s.* to 8*l.*; Suss, fair to good, 8*l.* to 8*l.* 15*s.*; Spanish, fair to best, 9*l.* to 9*l.* 10*s.* per ton; Tripoli, good to ordinary, 5*l.* 10*s.* to 6*l.* per ton.—Brimstone: Best thirds, 7*l.*—Phosphate of Alumina, 3*l.* to 3*l.* 10*s.* per ton.—Pyrites: Spanish cupreous, 5½*d.*; non-cupreous, 6¾*d.*—China-clay: 15*s.* f.o.b. Cornwall; best quality, 24*s.*—Phosphates: High strength, 80 to 85 per cent., 1*s.* 4*d.* to 1*s.* 5*d.* per unit; Estremadura, 1*s.* 3*d.*; ordinary, 60 per cent., 1*s.*; precipitated phosphate of lime, 70 per cent., 5*l.* 15*s.*; super-phosphates, 80 per cent., soluble, 3*s.* 6*d.* per unit; 25 to 26 per cent., 3*l.* 10*s.*—Manganese: Ores, 100*s.* to 110*s.* for 70 per cent.—Iron Ore: Hematite, 24*s.* to 22*s.* 6*d.*; puddling, 24*s.* to 27*s.*; oolitic, 8*s.* to 10*s.*; Algerian, 50 per cent., 23*s.* to 24*s.*, c.f.i. U.K.—Antimony: French Star, 59*l.*—Spelter: Silesian, 26*l.*—Sheet Zinc: N. 6, 31*l.* 15*s.*; N. 7, 30*l.* 15*s.*; N. 8, 29*l.* to 29*l.* 10*s.*; N. 9, 29*l.* 10*s.*, c.i.f., Hull or Liverpool.—Quicksilver: 13*l.*

ARTIFICIAL FUEL.—The main object of the invention of Mr. F. Geary, of Great Winchester-street Buildings, is to manufacture artificial fuel from small coal, coke, or other carbonaceous substances, by mixing same with any suitable form of magnesia, and subsequently treating the same to form compact blocks.

PURIFICATION OF GAS.—The invention of Messrs. WOODALL and WILLS, of the Phœnix Gasworks, Vauxhall, relates to a method of and apparatus for the better purification of gas from ammonia, carbonic acid, sulphuretted hydrogen, bisulphide of carbon, and their compounds, being accomplished by the injection into certain washers or scrubbers or system of washers or scrubbers either of the ordinary or some special form of a coubined jet or jets of steam and water, or of steam and ammoniacal liquor purified or not, or of sulphide of ammonium specially prepared, or of some other liquid purifying agent calculated to remove any or all of the above-mentioned compounds. The use of water, purified ammoniacal liquor, or sulphide of ammonium is not new; but the application of these liquids through the intervention of a compound jet or jets, consisting of one tube inserted within another, the outer one being used for the delivery of the liquid and the inner one for the injection of the steam, whereby the gas is subjected to a more effectual washing is new; as is also the use of crude ammoniacal liquor by means of the said jet or jets for the removal of sulphur compounds from gas which has been previously freed from carbonic acid.

IMPROVED PERMANENT WAY.—The invention of Mr. MORITZ HILF, of Wiesbaden, relates to an improved mode of constructing permanent way, and consists in the employment of longitudinal sleepers of rolled iron, upon which the rails rests, and to which they are connected by screw bolts in combination with traverse sleepers, also composed of rolled iron, which are arranged at the junctions of the ends of the rails beneath the longitudinal sleepers, and connected to the latter by angle iron and bolts. The sleepers are by preference made of an inverted trough-shape with a central web, and they may rest upon a bed of stone or gravel. Tie bars are employed at intervals for connecting the rails together, to which they are secured by nuts; and ordinary fish plates are fitted at the joints of the rails.

EXPANDING TUBES.—The tool invented by Messr. PAGAN, RICABT, and MONTEJO, of Philadelphia, for expanding boiler tubes consists of a stock or body having a longitudinal core, in which fits a threaded mandril, formed in two sections united by a swivel connection; a roller head screwed into the upper end of the body and formed with oblong slots, in which fits rollers held in place by plugs, said rollers being inserted from the inner end of the heads. The other end of said head being solid; a band for governing the exposures of the expanding rollers, and a clutch for preventing the mandril from advancing when it is desired to rotate the same for the purpose of smoothing a tube without expanding it. The sections of the mandril are respectively a cylindrical threaded part, and a smooth tapering part, the latter removable from the former. The governing band is provided with an internal slot engaging with grooves of varying lengths on the outer surface of the stock according to the amount of exposure of the expanding roller, and conforming to the thickness of the crown sheet of the boiler.

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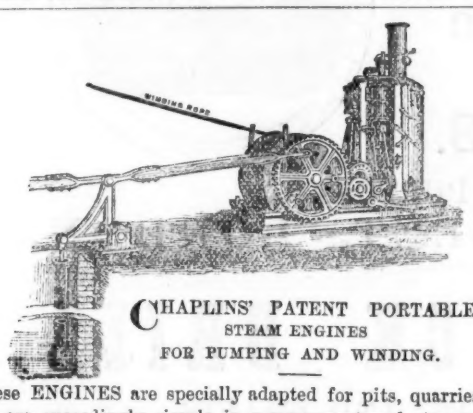

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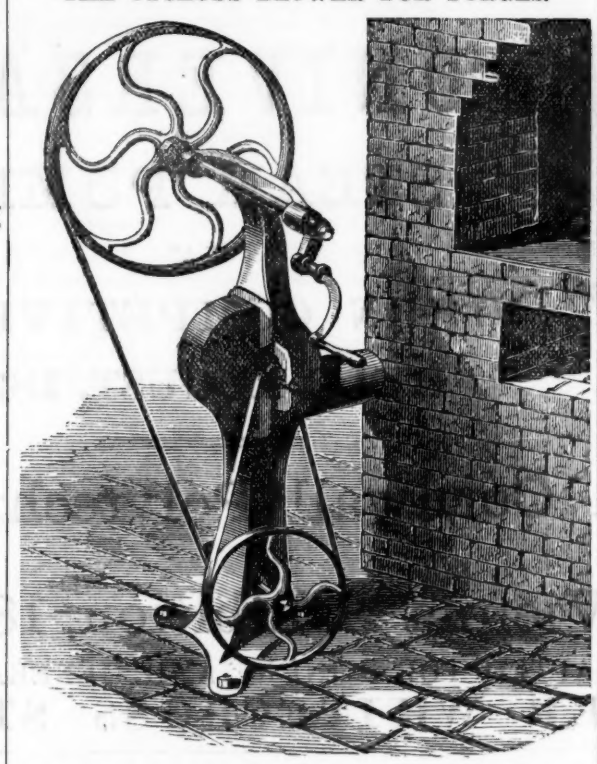
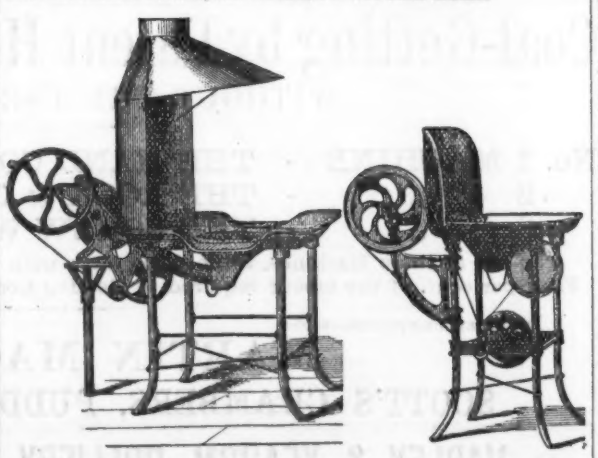
THE CYCLOPS BLOWER FOR FORGES.



A new plan of supplying wind for blacksmiths forges has been exhibited by Messrs. Rownson, Drew, and Co., of Upper Thames-street and Queen Victoria-street, at the Agricultural Hall this week, and attracted considerable attention. A small fan in the centre of a cast-iron standard is, as will be seen in the illustration, worked by hand either by an overhead pulley or with a small wheel, or a treadle may be worked by the foot. The blast is much more powerful than that of the largest sized bellows, and being constant enables a welding heat to be produced on a bar in very much less time, and that, too, with very much less labour, than is required to work bellows, which, as most of us know, is hard work even for a strong man. There is also considerable economy of space, which in most smithies is an important matter, and the machine is fixed in the most simple and easy manner. The wind is introduced either through an ordinary forge back, which, however, must have a specially designed connection, or is brought up through the bottom of the hearth on the American principle. By this latter arrangement there must be a considerable saving of fuel, as the blast is introduced hot. One of the machines exhibited at Islington was fitted to a heavy cast-iron hearth, having a trough for each, water and slack, which would, no doubt, be most useful for purposes where something more than a portable forge is required, and yet where it is undesirable to erect an ordinary brick hearth, such as in railway and other works. It seems capable of doing the heaviest work in a very small space. The apparatus can also be attached with the greatest ease by any ordinary bricklayer to any existing hearth, and this will be a great boon to many who know by experience that the cost of repairing a pair of bellows is almost as much as that of a new pair. In the Cyclops blowers leather, except in the belts, is entirely dispensed with, and even these can be replaced with chain gear for outdoor work, consequently the machine has an immense advantage over bellows in durability, as well as in power, economy of space, and ease of working and fixing. The Cyclops blower was exhibited recently at Falmouth at the Royal Cornish Polytechnic Society's exhibition, where it was severely tested by the judges with the most favourable results, and awarded a first-class medal.



A somewhat similar principle adapted to portable forges was also exhibited, and those who tested it were struck with the great portability attained, which is not attained, however, at the sacrifice of strength, as all the legs of the forges are made of tubes, and fastened in a novel and, certainly, very ingenious way. These are made in many sizes to suit all requirements, and for rivetting and outdoor work generally they will, it is thought, entirely supersede the old kind, which are very frail and liable to get out of order. One of these "Keystone" forges is constructed specially for army or navy, mining, and kindred other work, and, being made entirely of wrought iron, combines extreme portability with strength. The legs, of angle iron, are removable from their sockets, and the whole apparatus packs up in the body of the forge, which forms an iron box measuring only 22 by 27 by 10 in., and can be fixed or packed up in one minute, and this is said to be powerful enough to work 4-in. round iron, which is more than any existing really portable forges can do. No doubt is entertained that these blowers and forges will come into general use when known, and will do much to lessen the really hard work of smiths. Both machines may be daily seen in operation.

NEW PROCESS OF TREATING ORES.

Much attention has recently been directed in San Francisco to a new process, the invention of Mr. DEMITRY MINDELEFF, of treating ore by submitting it to the action of carburetted hydrogen and heat, and from the description given in the New York "Mining and Scientific Press" there appears to be good promise of success. The gas is not required in a chemically pure condition, though it may be so used if economy would justify it. When this marsh gas is made from coal it is distilled at a high temperature, in order to get an excess of that gas desired. When illuminating gas already manufactured is used it is passed through a separate retort, filled with red-hot coke, in order to convert the olefiant gas into marsh gas. This gas can also be distilled from wood or other substances.

In carrying out the process, a retort is arranged in the usual way, having a head which can be hermetically sealed. The retort is furnished near one end with a suitable pipe, through which the gas is admitted from the reservoir. The gas used in the preliminary trials is the ordinary illuminating gas of the city, which is passed through a separate retort, filled with red-hot coke, before being turned into the ore retort. The pipe referred to is supplied with an ordinary stop-cock. At the opposite end of the retort is an escape pipe, which is also provided with a stop-cock and a short branch pipe, in the end of which latter a gas burner is secured. The escape pipe has its outer end bent downward into a small barrel of water. The retort is, of course, over a suitably constructed furnace. The retort is charged with ore, and the head or door hermetically sealed. Gas is admitted to the retort, which will soon expel the air therefrom. A strong red-heat is now applied, when the reaction at once commences. It is noticed that during the process of reduction the gases escaping from the burner will not ignite, but as the reduction nears completion the gas emits a dull bluish flame, and increases in tone until all the metals contained in the ore are reduced to a metallic state, when the flame burns brightly.

When the reduction is completed the ore is removed from the retort, placed in a furnace, and melted with suitable flux. The malleable metals will sink to the bottom and the slag rise to the top. In case the ore contains pyrites or bisulphide of iron, it is roasted in the open air before it is introduced in the retort. In the event of the ore containg copper and silver in combination with sulphur, as usual, and it is necessary to obtain a separation of these metals after their reduction in the retort, the spongy metals are dissolved in sulpuric, acid, and sulphate of silver is then separated while in the solution from the sulphate of copper, by an addition of common salt, which will precipitate the chloride of silver and leave the copper in solution. The chloride of silver is then treated with heat and marsh gas. When the ore, besides copper and silver, contains gold and lead after the reduction by heat and marsh gas, as described, the metals can be melted in a solid mass, and this alloy treated with sulphuric acid, which will dissolve the silver and copper, and leave the gold and a portion of the lead in an insoluble state. The solution containing the silver and copper is then poured off, which is treated with chloride of sodium, as stated above, and the remaining gold and lead are melted with a suitable flux. In treating the chloride of silver with marsh gas, for the purpose of reducing it to a metallic state, it is not necessary to use as high a degree of heat as when treating ores. If it is desirable to have it left after treatment in a spongy state, a dull red-heat is all sufficient.

The trials now being made in San Francisco are to be formally reported upon by Messrs. J. R. Smedberg and E. M. Robinson, with Mr. C. E. Luckhardt, and their opinion as to the technical and economic value of the invention will be made known without delay. If it turns out metallic copper, for instance, in this one process, as the inventor claims, it does away with the 10 or 12 different processes usually required for this purpose. The ore, as it comes from the retort, is perfectly friable and spongy, and can be pulverised by pressure between the fingers. In some of the copper ore which had been treated by the process the copper, in an apparently metallic state, in small fibres and bunches, appeared all over the surface and through the whole mass of every lump. The coal from which the gas is made is used in the form of coke for heating the retort. The amount used per pound of ore will be shown in Mr. Smedberg's report, and Mr. Luckhardt, the metallurgist, will of course state the economic result, and the state of the metals in the ore after passing through the retort.

IMPROVED MOTIVE POWER.—According to the invention of Mr. J. LUDEKE, of Camden Town, a foundation and standards support two pivotted oscillating axes, on which two sets of four hollow radial arms are borne, to the ends of which four telescopic cylinders with hemispherical ends or covers are connected and attached, and thus a communication is established between the series so that the cylinders and tubes containing air or gas, when inserted, with the foundation and standards, in water or other liquid or fluid or mercury, will rotate by reason of the most extended cylinder with its greater capacity than its opposite cylinder, possessing buoyancy sufficient for the purpose, The tubular arms are set at an angle and not parallel to each other, and consequently the continual transfer of air or gas from one to the other and the successive change of the diverging angles of the tubes, cause the extension or decrease successively of the cylinders. Or two vertical discs set at an angle may be used, with a central axis and hollow spokes, the cylinders then travelling within the varying space between the discs. Thus power and motion commence and continue.

PULVERISING ORE.—The invention of Mr. C. LUCOP, of Southwark relates to new or improved machinery for grinding, crushing, pulverising, and reducing to powder various vegetable, mineral, and animal substances, which is accomplished by means of centrifugal force. Machinery arranged and combined in accordance with this invention is constructed with a circular metal or other casing of a flat, elliptical, or other form, or it may be a long flat sided oblong or other suitable form. A shaft passes through the centre and has keyed upon it suitable arms to act upon a ball sphere or roller of metal or other material (or a series of them), and when the shaft revolves the balls or other bodies are carried round by the arms or by the centrifugal action, so as to run on the interior periphery of the casing, and thus by centrifugal force crush, grind, and pulverise the substances they come in contact with. If desired rotary motion may be given to the casing in an opposite direction to the arms, or the arms may be stationary and the casing revolve.

TREATMENT OF PHOSPHATES.—The invention of Mr. M. PRENTICE, jun., of Stowmarket, relates to the treatment of natural products containing phosphoric acid and alumina; and consists in subjecting such natural phosphates to the action of alkali or alkaline carbonate, such for example as caustic soda or carbonate of soda or soda ash, or to what is known as black ash liquor or to other alkaline products, such for example as the waste alkaline liquors from paperworks, in order that the phosphoric acid and the alumina contained in the natural phosphates may be separated therefrom by being thus rendered into a condition capable of being dissolved in water; or instead of employing any of the before-mentioned alkaline compounds or products, I submit the phosphate of alumina by preference in a finely divided condition in conjunction with sulphate of soda, coal or other carbonaceous matter to the action of heat in order that the phosphoric acid together with the alumina shall be converted into a soluble condition.

CENTRIFUGAL PUMPS.—Mr. C. TEGNANDER, of Gothenberg, has invented a revolving chamber or drum so constructed as to give adequate rotary motion to the fluid to be pumped, and having central supply and discharge orifices, and within the revolving chamber or drum is affixed an internal stationary chamber or drum, inside which the fluid pumped is protected from the action of the rotating force applied to the revolving chamber. This internal chamber communicates by an opening or openings in or near the circumference of the same with the interior of the revolving chamber before described, and externally through the central discharge orifice of the revolving chamber with a central discharge pipe in the line of the axis of revolution of the revolving chamber, to which revolving chamber the discharge pipe is fitted by a stuffing box and gland, or other arrangement, to make it approximately water-tight.

PEAT FUEL.—The invention of Mr. FRANKLIN DODGE, of New York, has for its object the manufacture and refining of peat for fuel. For this purpose the crude bog peat is first subjected to a peculiar grinding and kneading process, by which it is mixed with water and well puddled until the peat is thoroughly taken up and held in suspension in water; this mixture is then pumped up and forced through pipes to any convenient distance, where it flows into a drying ground and spreads over the same, and is held therein by suitable dams forming a shallow basin, where the valuable portions of the peat settle to the bottom in fine powder, forming a homogeneous mass, after which the water is drawn off and the residuum is allowed to dry.

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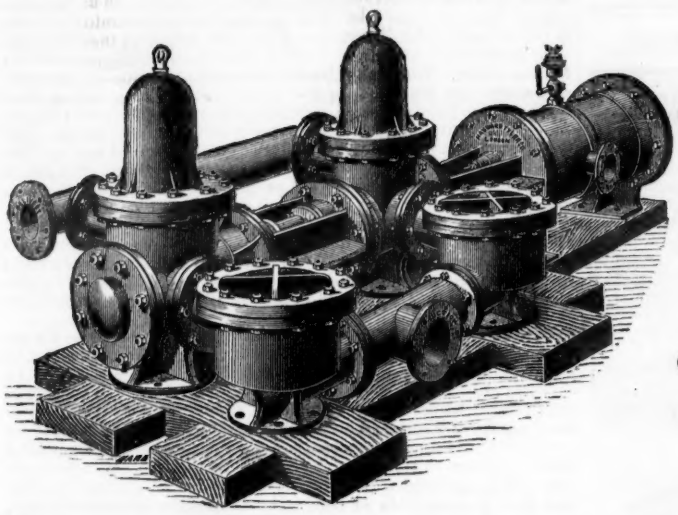

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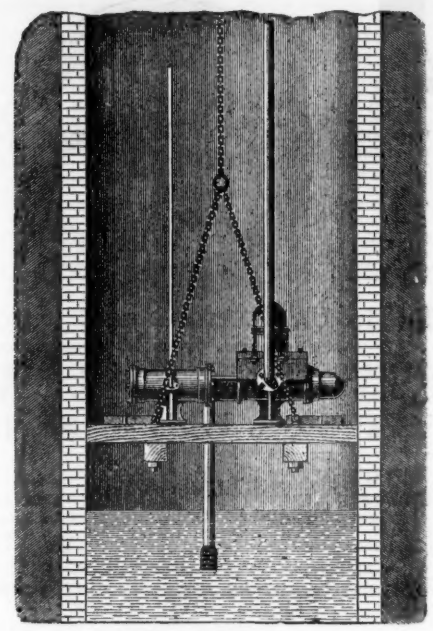

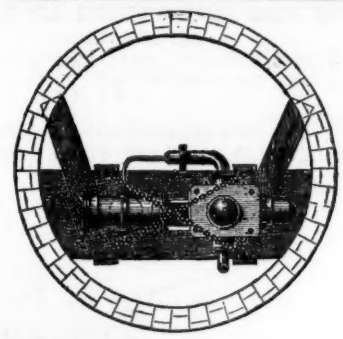

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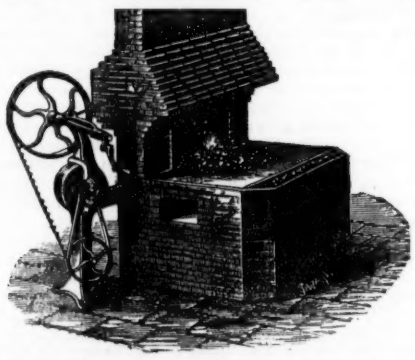

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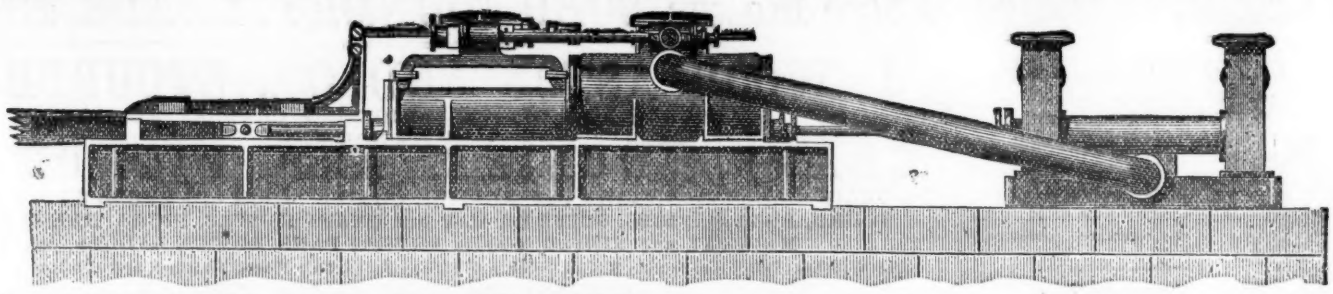

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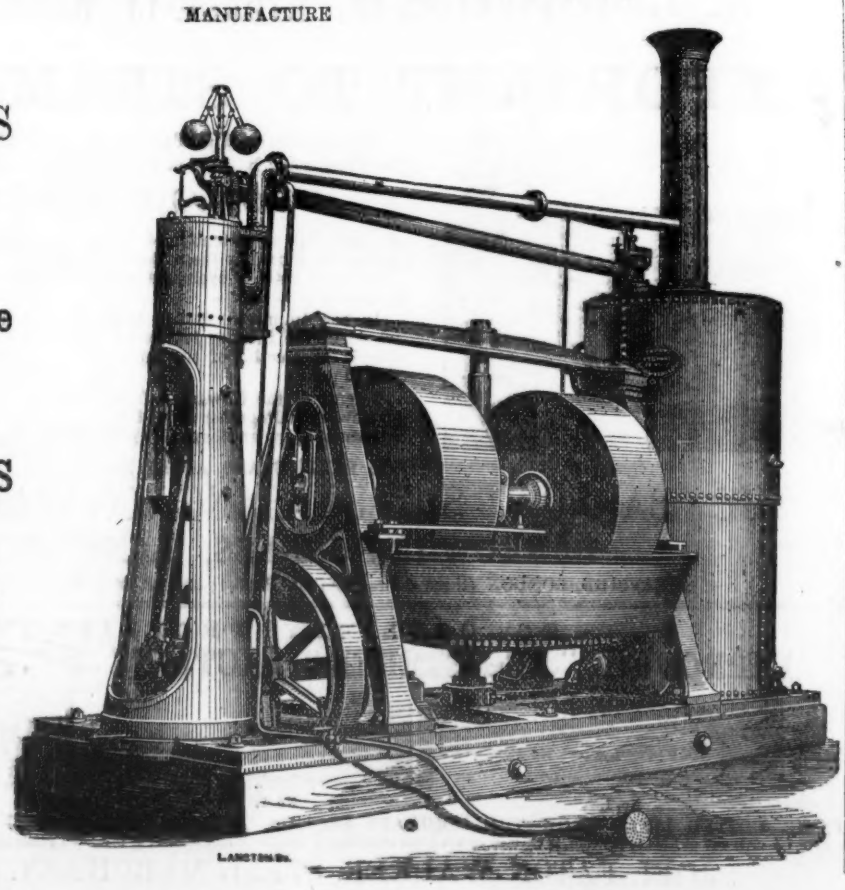

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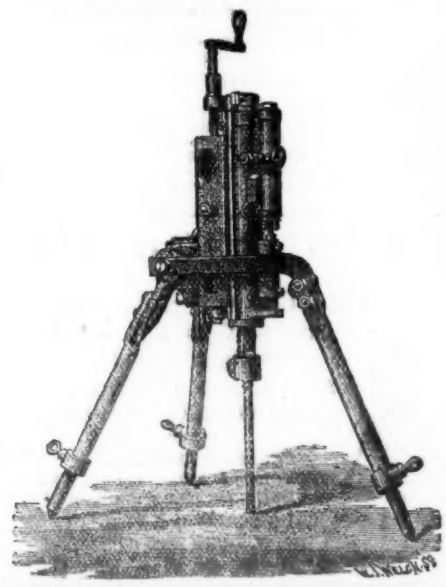

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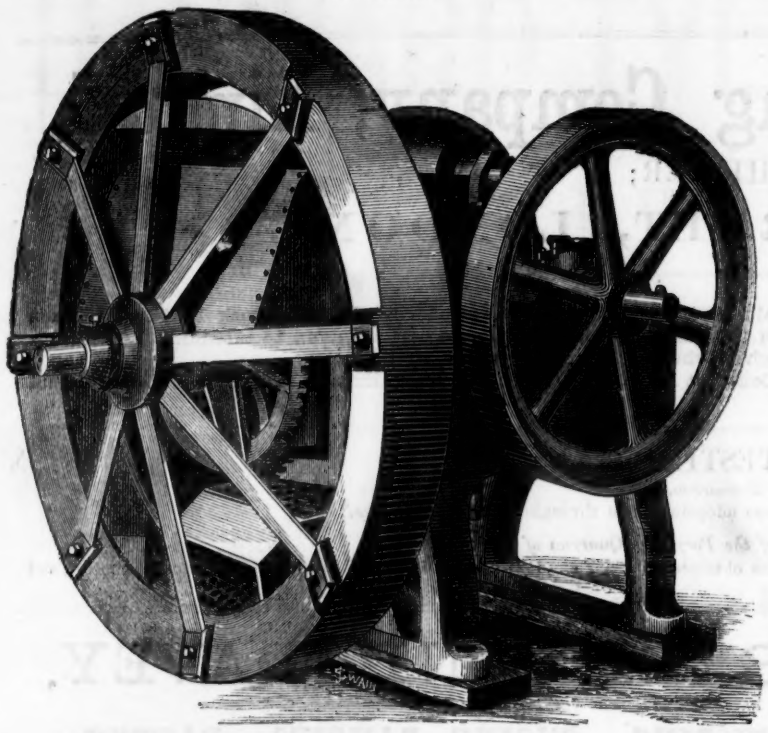

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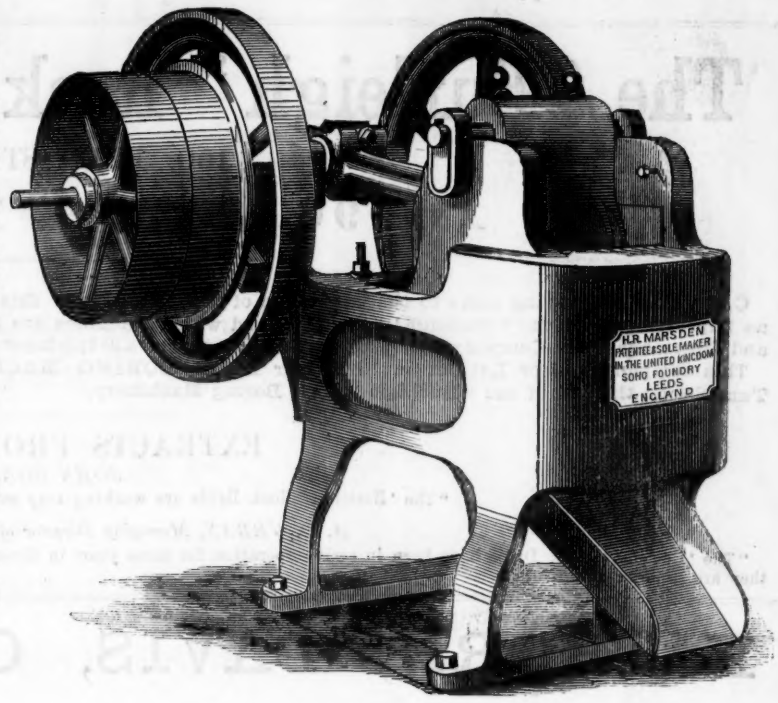

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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

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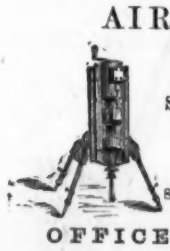

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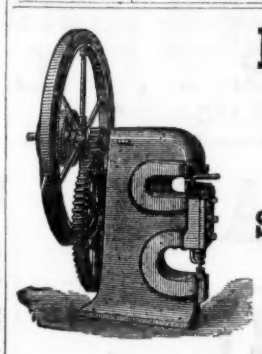

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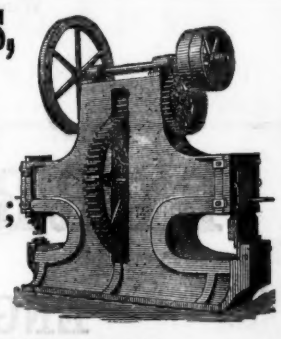

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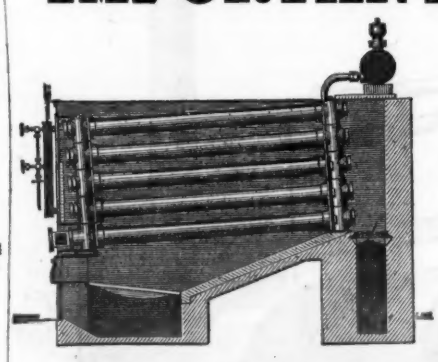

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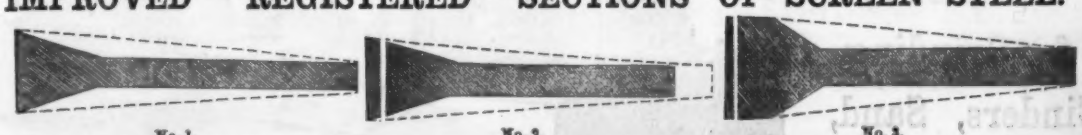

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